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Journey of a Word

Stranger than any Jules Verne fiction is the trip your voice takes by telephone. It spans the continent in one-twelfth of a second — over a private speedway with green traffic lights all the way.

Your voice is changed into electrical waves so that it can travel over the wires. Some waves travel too fast, and have to be slowed down, so others can keep pace. Waves get tired, and electronic amplifiers give them new energy to speed them on.

All arrive at journey's end on split-second schedule and out steps your voice — changed back into words again. The wonder of it is that the words sound like you and are you — with your own tone and mood and personality.

Bell Telephone Laboratories design, improve and fit together the millions of intricate parts that make possible the journey of your words. It is a job that never ends.

It is this constant work of improvement that helps the Bell System give you the best and the most economical telephone service in the world.

BELL TELEPHONE SYSTEM

Our Municipal Notebook

Survey Reveals Widespread Agreement on Slum Clearance Needs

REPLIES to a questionnaire on slum clearance sent out by Senator Robert F. Wagner reveal a surprising amount of agreement on the need for public housing and immediate passage of S. 866, the Taft-Ellender-Wagner Bill, over-all housing legislation now awaiting action in the Senate.

Answers were received from 82 mayors, speaking for cities with a 1940 population of 31,000,000; from 29 governors, and from 133 prominent individuals. Complete results of the survey are contained in the report, "Slum Clearance," issued by Senator Wagner for use by the Joint Congressional Committee on Housing.

Included in the findings of the report are the following:

Mayors from 78 cities, representing 41% of the urban population, estimated that 1,800,000 housing units in their cities are substandard.

Out of 230 replies from all sources, 206 state that private enterprise cannot in the foreseeable future provide either new or used housing of adequate quality to meet the needs of low-income families at the rents or costs they can afford to pay.

Out of 218 replies, 196 believe that public housing is necessary to meet the need. Of these, 189 favor continuation of the federally aided public housing program begun under the U. S. Housing Act.

Three-fourths of the governors and over nine-tenths of the mayors say that the cities are unable to finance construction of low-rent housing, and an even larger percentage say they are unable to provide subsidies, other than tax exemption, to allow low-income families to afford such housing.

More than 90% of the mayors of cities where public housing under the U. S. Housing Act is in operation feel that it has served low-income needs, and all of those replying feel it has been built and operated efficiently. All but one of 43 mayors in these cities feel that low-rent public housing has never competed with private enterprise, and 80 to 100% feel it has improved property values, reduced costs to the city, and improved delinquency and health conditions.

Out of 207 replies from all sources, 188 believe a program for redeveloping blighted areas is needed, and 180 of these feel public assistance is necessary to do this. Of those replying about 70% feel that federal-aid provisions in the Taft-Ellender-Wagner Bill are adequate, with a majority of those dissenting feeling that these provisions are inadequate and a minority feeling they are too liberal.

Where some form of state redevelopment legislation now exists, only one of 10 governors and only three of 45 mayors feel such legislation is sufficient to do the whole job. None of the mayors and governors where no state legislation is available feels that the cities and states can meet the whole problem themselves.

City Managers At Three Intersections

THAT the average city manager, in theory a free agent responsible only to the policy-making council, actually finds himself at the intersection of three different currents of demands, complaints and pleas, is pointed out by Associate Editor Richard Thruelsen in the February 28 issue of the *Saturday Evening Post*. He deals with the situation in "City Manager's Assistant," latest article in his Men at Work series, which describes the job being done by John Budd Wentz, administrative assistant to City Manager C. B. Wirsching, of Long Beach, Calif.

"There is the council," Mr. Thruelsen writes, "which not only hires the city manager but can fire him for due cause after a public hearing—or, in the practical way of councils, can make his life so unpleasant that he resigns. The council must be satisfied. There is the public, which voted in the charter and, as his actual boss, looks upon him as the bearer of all municipal blessings and the author of all the city's sins. The public must be satisfied. And, lastly, there are the city employes whom he appoints and for whom he is to have a well-run government. The city employees must be satisfied. The fact that politics, which is supposed to go no farther than the council chamber and a few elected officials . . . often appears where it is least expected also demands a reasonable realism from a city manager."

The city manager system, a "strong executive" plan with all administration centered under one man, depends to a great degree for its success upon the caliber of the manager, Mr. Thruelsen points out. To supply qualified administrators, a dozen or so colleges now offer courses in public administration, and some of the manager-run cities help in the essential training.

Voting Machines Widely Used in New Jersey

IN THE next election in the 22 municipalities of Essex County, N. J., the votes will be counted by 778 Automatic voting machines. They are originals of the order placed by the County for 800 in 1937. The other 22, ready if needed, will be in reserve. Elmer J. Herrmann, Deputy Commissioner of Elections, says that repairs and maintenance have been virtually negligible during the entire 12 years that the machines have been in use. Essex was the first county in New Jersey to install them, and now all first- and second-class counties in the state vote by machines. Conditions virtually compelled the step. Mistakes sold the idea of installing the machines. There were too many mistakes in counting the votes—as many as a hundred in a single district—and election personnel had to work half the night making counts.

Subtitle 15 of the New Jersey election law, presenting the Voting Machine Procedure, might well be studied by the governing bodies of municipalities and countries not voting "the accurate way." The stated requirements which the machines must meet are, in effect, the mere essentials of an honest election: secrecy of ballot, ability to split a ticket, one vote per voter, no tampering after the polls have closed, and the like.

In New Jersey, the adoption of machine voting is at the discretion of the governing body of a county, by any city council or city commission, or by majority in a public referendum. The referendum may be placed on the ballot by a petition of 10% of the qualified voters. Upon adoption, the governing body shall acquire a complete equipment of machines within 18 months. "In all counties of the first class, on and after September 1, 1940, voting machines of this type shall be adopted by purchase or rental and paid for at the rate of not more than $300,000 in any one year."

The annual cost of the Essex County Voting Machine Division was $56,745 in 1946. Against this are savings estimated at $78,400 attendant upon the use of voting machines. Those savings comprise lower rates of compensation for election officers, voting equipment, and 88 new districts made unnecessary. "Many of the major advantages of voting machines cannot be reckoned on a dollar and cents basis," says Mr. Herrmann. "They are incalculable."

ALL SIZES IN STOCK
For repairing clean breaks in cast iron pipe.
Also in stock—believe it or not!—small sizes
of SKINNER-SEAL Bell Joint Clamps! M. B.
Skinner Co., South Bend 21, Indiana, U.S.A.

OUR FIFTIETH ANNIVERSARY

SEE OUR EXHIBIT,
BOOTH 71,
ATLANTIC CITY

SKINNER-SEAL SPLIT COUPLING CLAMP

Interest Costs Higher for Municipal Improvements

THE financing of municipal public-works programs from borrowing will be still more expensive as a result of the recent increase in interest rates of municipal bonds. As of March 4, *The Bond Buyer's Index*, composed of the average yield of twenty representative long-term municipals, showed an interest rate of 2.46% compared to the January level of 2.35%.

Many municipalities, when considering major essential capital improvements, deferred since the start of the war, will have to take another look at their programs and revise their estimates for carrying charges because of the recent drastic price correction on municipal bonds. Municipal bond yields have now risen more than a full percentage point since April 1946, when bond yield averages were 1.45%. The present trend has resulted in a 60% increase in the cost of borrowing.

An article in *The Bond Buyer* by Reginald M. Schmidt, vice-president of Blythe and Co., New York, points out, however, that the situation also has a favorable side. Because the investor field for municipal bonds has been broadened, municipalities should have little difficulty in attracting investment capital for their improvement programs. Considering the tax exemption feature of municipal bonds, their yields, ranging from approximately 2.25% to 2.75%, now compare favorably with those available on high-grade corporate bonds, ranging from 3% to 3.25%. Predictions for another record-breaking volume of new-issue financing in 1948 emphasize the importance of maintaining these sound related values, he says.

The recent increase in interest yield on municipal and U. S. Government bonds has still another aspect, according to the March 1948 issue of *Tomorrow's Town*, published by the National Committee on Housing. This issue is devoted to a symposium on mortgage interest rates. Several of the contributors point out that it is becoming more difficult to finance private housing under the G.I. loan program or FHA Title VI, as the maximum interest for mortgage loans under these programs is fixed at 4%. Government and municipal bonds, which are tax exempt, marketable, and require little expense to handle or service, are now becoming more attractive to lending institutions and are competing for investment capital that might otherwise go into the mortgage-loan field.

It is evident that municipal officials will have to weigh carefully the advantages and disadvantages of the current financial trend before making any prediction about its effect locally.

Religious Teaching in School Buildings or on School Time

THE U. S. Supreme Court's 8 to 1 decision of March 8, that a state's tax-supported public-school building may not be used for the dissemination of religious doctrines, appears not to rule definitely on whether pupils may legally be excused during school hours for religious instruction elsewhere. The decision does say, however, that:

"To hold that a state cannot consistently with the First and Fourteenth Amendments utilize its public-school system to aid any or all religious faiths or sects in the dissemination of their doctrines and ideals does not, as counsel urge, manifest a governmental hostility to religion or religious teachings. A manifestation of such hostility would be at war with our national tradition as embodied in the First Amendment's guaranty of the free exercise of religion. For the First Amendment rests upon the premise that both religion and government can best work to achieve their lofty aims if each is left free from the other within its respective sphere."

THE AMERICAN CITY associates itself with Walter D. Cocking, chairman of the Board of Editors of *The School Executive* in the point of view expressed on his "As I See It" page in the April issue of that magazine. Here are Dr. Cocking's concluding paragraphs:

"As I see it, it should be as possible to teach about religion in the public schools as it is to teach about the war between the states or about the system of political parties. There are facts about religion which are uncontestable, such as the need all individuals have for a satisfying religious life, the story of the founding and developments of different religions and the various churches, the principle of separation of church and state which is peculiarly the American way, the right of an individual to choose his own religion and the particular church which he believes interprets his own ideas and needs. These things the public school can and should teach, but they should be taught by teachers as thoroughly prepared in what they teach and how to teach it as any teacher of science, reading, or other subjects.

"Teaching and interpreting the belief's of any particular religious group or church, on the other hand, are not and cannot be the tasks of the public school. The responsibility for such teaching must be accepted by the religious groups in question. And such teaching should be done entirely outside of school time, and off the public-school premises. The schools have their job to do; so do religious groups and churches. The public school's job is related to all the people. The particular religious group's job is related to the needs and interests of its communicants and those who have sympathy with it. Religious groups cannot do the public school's job, and neither can the public school do the job which a religious group should do. Each should zealously protect and safeguard the functions and rights of the other."

Columbia Establishes Institute for Urban Land Use and Housing Studies

ESTABLISHMENT of an Institute for Urban Land Use and Housing Studies, financed by a $100,000 grant of the Rockefeller Foundation, has been announced by Columbia University. Dr. Ernest M. Fisher, professor of Urban Land Economics, has been appointed director. Working with him will be an administrative board of University experts in economics, architecture, sociology, law, business, and other fields. An advisory board of nationally known business leaders will be headed by Henry Bruère, president of the Bowery Savings Bank.

One of the major purposes of the Institute will be to combine the resources and techniques of the several fields of study that can contribute to an understanding of the nation's housing problems and the trends influencing growth of centers of population. New York and surrounding communities will be only one of the areas of study. Results of the investigations will be published as they are completed.

Graduate students will be trained by working with the Institute in the techniques of investigation and the processes of analysis of land-use and housing problems.

Inter-American Municipal Congress

THE promotion of understanding and good relations among cities in the Americas will be the basis of the program for the Third Inter-American Congress on Municipal History, to be held in San Juan, P. R., April 12 to 17. Comparative American municipal law, political and cultural history, and city planning and social service will be discussed. Mrs. Felisa R. De Gautier, city manager of San Juan, will act as hostess to guests at the conference. Scheduled events include special ceremonies on April 14, Pan American Day, and the opening of an exhibit on American city planning and architecture.

. . . "and we find that our pressure has improved since the installation of the new tank"
French H. Smith, City Manager
Lexington, North Carolina

ENGINEERING DATA

- Source of Water—Lake and Creek
- Population Served—15,000
- Maximum Daily Consumption—2,500,000 gals.
- Minimum Daily Consumption —1,800,000 gals.
- Per Capita Consumption—135 gals. per day

It's an old story, proved many times by actual pressure charts—when a city installs a Horton elevated tank, pressure in the water distribution system improves.

The 1,000,000-gal Horton tank shown above was recently erected at Lexington, N. C. It supplements existing storage of 385,000 gals. in standpipes and a lake reservoir which covers 75 acres with an average depth of 8 inches.

Water works engineers and city officials who are responsible for the erection of large-capacity elevated tanks for gravity pressure in a water supply system provide several benefits for their cities. Some of them are: a reserve of water for fire protection, lower insurance rates and provision for pumping during off-peak periods.

Write for quotations on *Horton* elevated tanks when providing better water service for your city.

CHICAGO BRIDGE & IRON COMPANY

Birmingham 1.....1502 North Fiftieth Street
Houston 2.....2101 National Standard Bldg.
Tulsa 3.....1625 Hunt Bldg.
New York 6.....3308—165 Broadway Bldg.
Cleveland 15.....2236 Guildhall Bldg.
Los Angeles 14.....1403 Wm. Fox Bldg.
Chicago 4.....2127 McCormick Bldg.
San Francisco 11.....1233-22 Battery Street Bldg.
Philadelphia 3.....1616-1700 Walnut Street Bldg.
Atlanta 3.....2114 Healey Bldg.
Havana.....402 Abreu Bldg.
Detroit 26.....1501 Lafayette Bldg.

Plants in BIRMINGHAM, CHICAGO and GREENVILLE, PENNSYLVANIA

Water Supply and Treatment

New Life for 75-Year-Old Pipe

ON a test of a 6-inch cast-iron pipeline 75 years old, the Philadelphia Suburban Water Co., Bryn Mawr, Pa., discovered that the Hazen-Williams flow coefficient could be raised from approximately 75 to 128 by cleaning the line and coating it with asphalt in accordance with the Pittsburgh-Eric process. The lining was applied by the Pittsburgh Pipe Cleaning Co., Pittsburgh, Pa. These processes indicated a substantial restoration of the main's original capacity. Mr. George H. Dann, Superintendent of the Philadelphia Suburban Water Co., disclosed these findings at the recent AWWA Four States Section meeting held in Washington, D. C.

The test was limited to a single job, Mr. Dann explained, and involved 560 feet of pipe. Several months after the test had been completed, a section of the main was removed for examination and inspection. The coating appeared to be unchanged. Although the test period was too short, in Mr. Dann's opinion, to base any service-life predictions, the appearance of the coating gave every indication of a service-life equal to that of pitch, tar, and varnish coatings.

The method, developed in England, electrolytically applies bitumen to lines that have been cleaned, placing it on the pipe surface in a manner similar to metal plating. There is one notable difference, however, in that the plating occurs at the anode instead of the cathode. In order to clean out the pits that may have corroded in the pipes, the cleaning operation employs the use of stiff wire brushes in addition to the conventional spring scrapers.

The thickness of emulsified bitumen, called "lectumen," is governed by the flow of the current through the pipe wall. When the resistance reaches a predetermined level, the cathode is pulled forward. The cathode's rate of movement varies from 2 to 6 feet per minute. Under normal conditions, the coating is applied continuously until the cathode has traveled the full length of the pipe. Upon completion of the coating operation, the lectumen is pumped out of the main.

The method has these advantages:

The line is out of service for only a short period, and only a few minutes' flushing is required before restoration to service.

It is not necessary to dig up and blank off corporations or other fittings.

It is not necessary to have a dry pipeline.

The coating imparts no taste or odor to the water.

The coating does not appreciably reduce the cross-section of the pipe.

Mr. Dann estimated that an old 6-inch pipeline can be restored to practically new-pipe capacity for about 46% of the cost of new pipe, and that a 24-inch line can be restored for about 22½% of the cost of a new pipe.

Reservoir Uplift Precautions

DETROIT, MICH., took out an inexpensive insurance policy against the possibility of the flotation of its big new Northeast station reservoir now under construction. To protect the structure against flotation in case of failure of the underdrainage system, 206 pressure-relief valves were installed in the base slab. These valves are designed to open and allow ground water to enter the reservoir when the differential head of water in the reservoir is 4 feet less than the ground water table. Also, they will serve during construction before the drainage system can be placed in operation.

Considering the nature of the soil and the underdrainage system provided, it is unlikely that these valves will ever be called upon to function. However, they provide excellent insurance at a relatively low cost. Anchor piles to serve the same purpose probably would have cost $343,000, whereas the valves will cost less than $10,000 in place.

L. V. Garrity, assistant general superintendent of the Department of Water Supply, Detroit, Mich., explained this precautionary measure in a paper delivered before the Michigan Section of the American Water Works Association held recently in Bay City, Mich.

One-Man Pipe Installation

PHOTO COURTESY OF U. S. PIPE & FOUNDRY CO.

A home-made crane with tongs like a broad-gage ice pick attached to a Scoopmobile makes the work of installing pipe a simple task during the extension of the water system at Michigan State College. The machine maneuvered handily into place four miles of bell-and-spigot pipe as well as three miles of mechanical joint pipe. A ladder-type trenching machine did the excavating.

FINE ENOUGH FOR THE LARGEST *Railroad* SYSTEMS

HUNDREDS of Layne Well Water Systems are now serving the Nation's largest railroads. And only in these systems have maintenance engineers found the rugged quality, long life and high efficiency that creates such unmatched reliability. Layne is proud of this splendid tribute to their years of sincere craftsmanship.

But railroads are not alone in this acknowledgment of water system superiority. The same preference applies to thousands of installations for cities, factories, dairies, chemical plants, petroleum refineries and irrigation projects.

The buying of a Layne Well Water System automatically obtains the very best of everything; — Layne skill in modern well drilling; — the correct type of screen and its proper installation; — the proper pump for sustained economical service; — and the final tests to prove that the system is thoroughly efficient in its operation.

For literature on Layne Well Water Systems address Layne & Bowler, Inc., General Offices, Memphis 8, Tenn.

Photo courtesy L. & N. Railway

LAYNE WELL WATER SYSTEMS

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Sewerage and Sewage Treatment

How New England Classifies Its Streams

ONE of the most recent large-scale efforts to coordinate stream-pollution abatement work regionally appears in the New England area. At the recent annual meeting of the American Society of Civil Engineers, Mr. Arthur D. Weston, director and chief engineer of the Division of Sanitary Engineering, Massachusetts Department of Public Health, explained the classification of waters agreed upon by the chief engineers of the various New England states.

Class A waters are those used as a source of drinking water or for the cultivation of market shellfish. They contain less than 50 coliform organisms per 100 ml. of water examined, are clear, and contain dissolved oxygen near to saturation.

Class B waters are identified as those used for bathing and recreational purposes. They have less than 1,000 coliform organisms per ml., are clear, containing dissolved oxygen near to saturation.

Class C waters have been designated as those used for recreational boating, fishing, culture of seed oysters or industrial supply. They should be free of "slicks," odors, or visible floating solids, and should contain enough oxygen to support shad and other hardy fish.

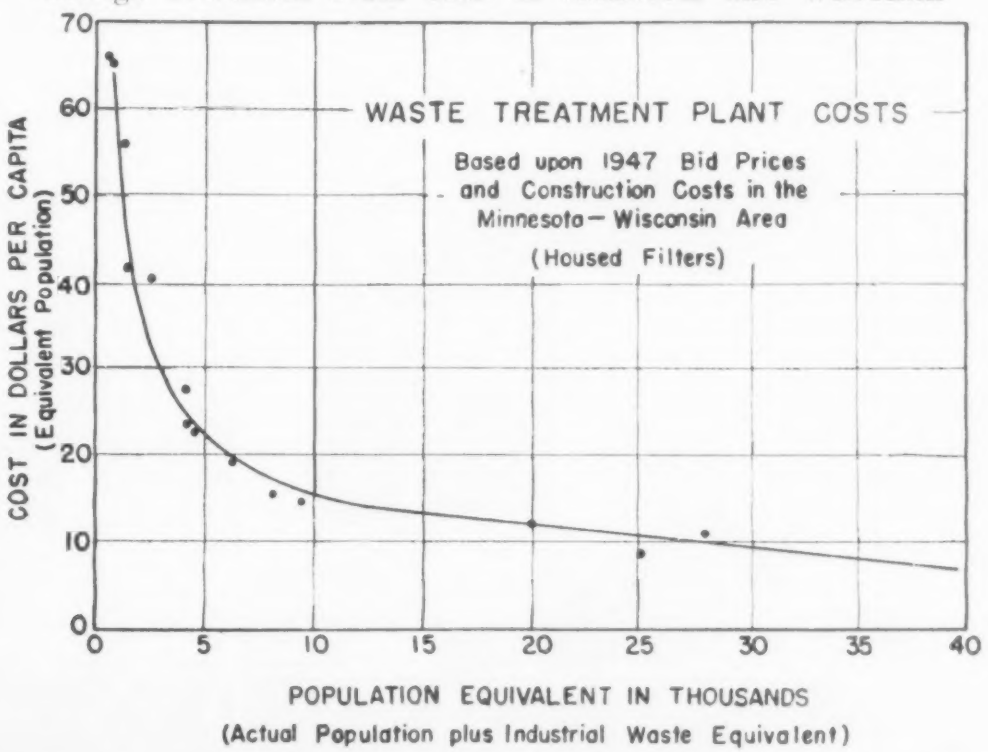
Class D waters have been designated as those used primarily for commerce, navigation, or transportation of wastes without nuisance. They also should be free of "slick" and visible floating solids. They should at all times carry some dissolved oxygen.

Mr. Weston explained that the classification carries no legal weight, but serves as a common basis for pollution control of interstate streams. The standards were established as the result of recommendations of the New England Planning Commission, a committee of the National Resources Board that has been studying stream purity.

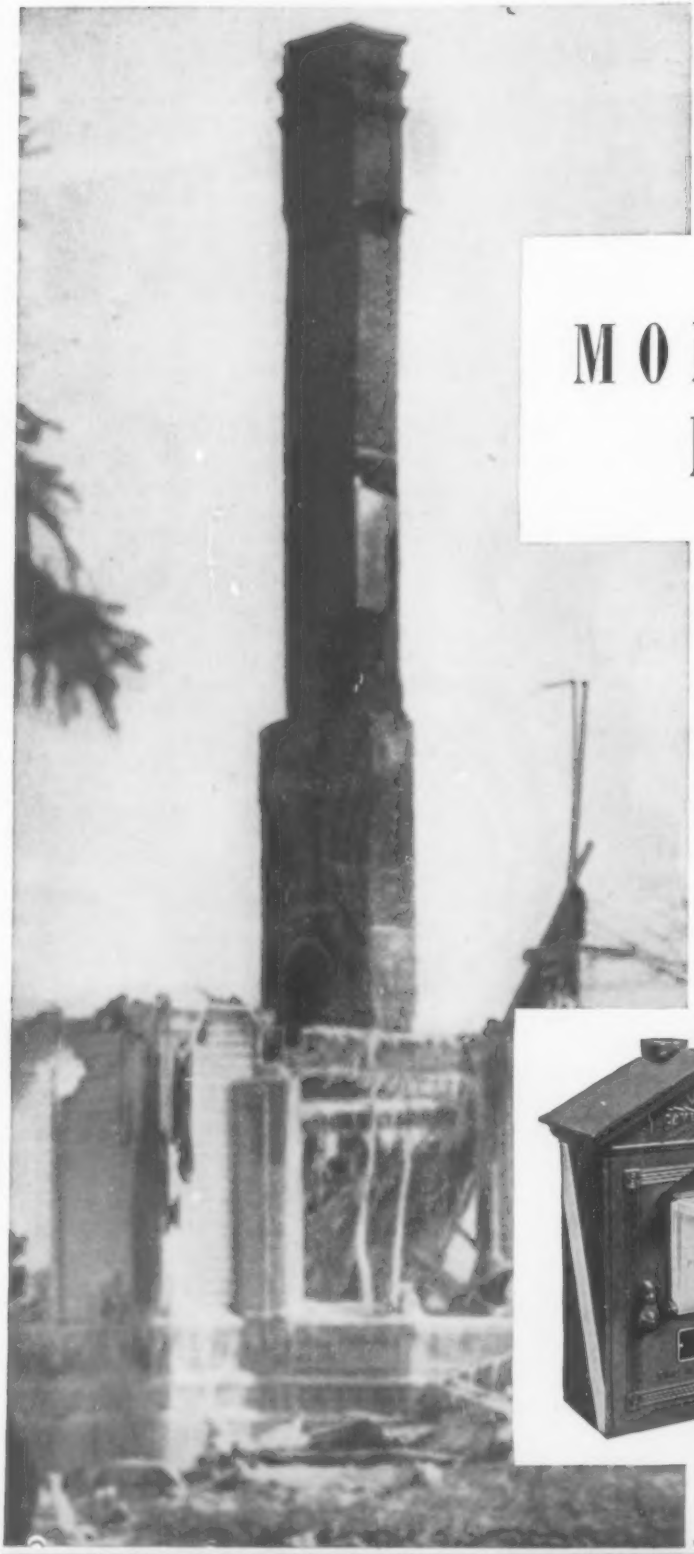
Out of these studies has arisen the New England Interstate Water Pollution Control Commission. It is based on the premise that New England is a region with similar characteristics, natural resources, and interests, and that consequently its general approach to the problem of pollution abatement should be uniform. The work of the Commission applies to streams, ponds, and lakes common to two states. Membership consists of five commissioners from each state. Unless otherwise designated, the membership will include one representative of fisheries or conservation, one from industry, one from municipalities, and two at large. No action by the Commission which imposes an obligation on any signatory state, subdivision, person, firm, or corporation is binding unless a majority of the commissioners of such state votes in favor.

At present the compact has been ratified by Massachusetts, Rhode Island, and Connecticut only.

Sewage Treatment Plant Costs in Minnesota and Wisconsin



How sewage treatment plant costs have been running during 1946-47 in Minnesota and Wisconsin. The graph was prepared by A. W. Banister and R. J. Ellison, St. Paul consulting engineers, for use in a discussion of sewage treatment in the February 1948 *Minnesota Municipalities.*



A MONUMENT TO NEGLECT

Fire Destroys Property

When property is destroyed by Fire, the community and everyone in it loses — Yet the community may protect itself against loss of wealth — and income — by keeping the fire losses low. There will always be fires — the problem is to extinguish them while they are small.

YOU Can Help

By urging your city government to provide adequate fire alarm box distribution. Prompt alarms reduce the fire loss and protect income.

THE GAMEWELL COMPANY

NEWTON UPPER FALLS 64, MASSACHUSETTS

IN CANADA: NORTHERN ELECTRIC COMPANY, LTD., MONTREAL

Public Safety

Modern Call System Speeded Further by Washington Police

POLICE headquarters in the Municipal Building, Washington, D. C., has a Central Complaint Room where calls of all kinds pour in by telephone from the public. Those requiring attention by radio patrol cars were formerly telephoned to the radio-transmitting station located several miles away at an outlying precinct station. There they were sent by air to the car in the area of complaint.

Though the radio police-call system consisted of all new FM equipment, here was an old-fashioned hold-over manual operation. Lieutenant Frank M. Beall, police engineer, decided to eliminate it by installing at the Central Complaint Room two new radio-telephone remote-control consoles which send out the urgent calls to cars without having to telephone them to the transmitting station.

Calls to headquarters continue to come to the ten land-line positions; but the hot ones are immediately recorded on the operator's log, then written on a complaint form, and passed into the glass-enclosed radio room by means of a slotted chute. It is picked up and transmitted at once to the particular cruiser precinct station.

New emergency call center at Washington, D. C., police headquarters, showing the remote-control consoles which have sending supervision of the radio transmitting station located several miles away. They are manufactured by the Federal Telephone and Radio Corp., Nutley, N. J. At far left is Lt. F. M. Beall.

In cases of extreme emergency, the radio dispatcher is flashed through his equipment by the telephone operator, and he listens in on the complaint call. This saves more seconds, as there is no waiting for the complaint form to be written. In all cases, however, complete records are kept and forwarded to all precincts, regardless of how the message was handled.

The new consoles, in addition to serving the public's complaint calls, permit tying into the network four different monitoring receivers of the adjoining county and state police departments and the fire department. They have complete sending-supervision of the transmitting stations.

New York's New Docks

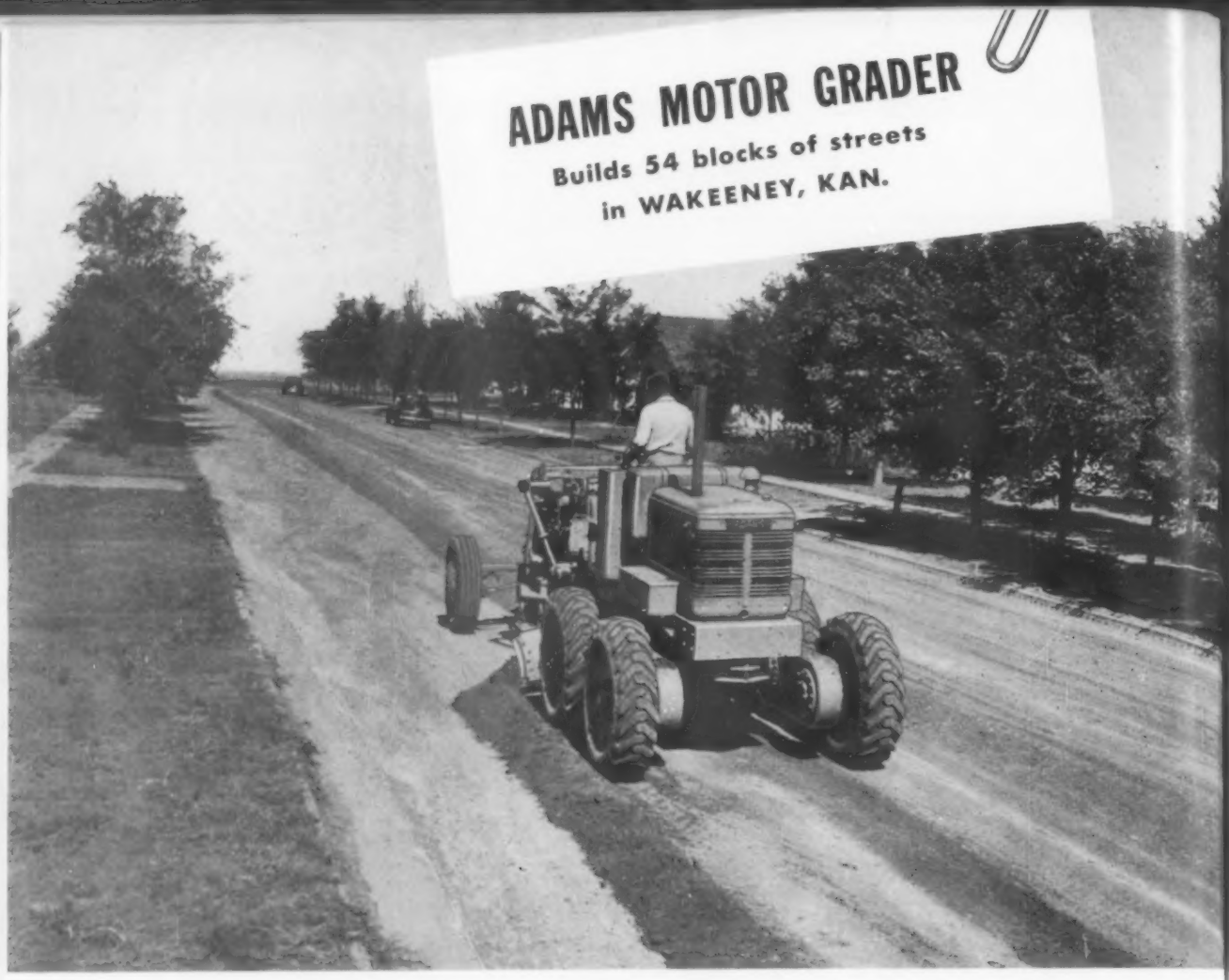
MANY safety measures are the result of disasters which pointed to their need. While no disaster was required to decide New York City in favor of steel piling, concrete decks, and steel superstructure for all its new piers, one did occur the same day in June 1946 that the plans and model of a new municipal ferry terminal at St. George, Staten Island, N. Y., were presented to the city. The disaster was a fire that resulted in the complete destruction of the old ferry terminal.

The fire originated in the superstructure and carried into the substructure. The superstructure, built in 1905, was steel with concrete floors, with sheet-metal siding fastened to wood undersiding. The wood sheeting of the undersiding was dry after 40 years' service, and the heat of the fire, communicated through the sheet-metal siding, quickly set the wood sheeting afire. With the natural flue between columns, what should have been a small fire became a raging furnace. The substructure under the concrete decking burned for many days.

The new design eliminates all inflammable material as far as possible. Built of concrete, steel, and other nonflammable building materials, it presents no material to feed a fire. It will be protected by a sprinkler system as prescribed by the New York City Fire Department and in accordance with the most modern practice. Its purpose is to quench any fire developing as a result of inflammable materials, such as newspapers and merchandise in the concessions and stands.

To eliminate the substructure fire hazard, the terminal is supported on concrete foundations and steel piling over landfill. The only fire hazard is the ferry wood-pile racks. These were necessary, as no other adequate system of ferry-rack construction was available for use. The racks are accessible to firefighting and thus are not considered as presenting any great fire hazard. The work on this $15,000,000 project will be completed in the latter part of 1949.

Docks and piers have three enemies: fire; borers (marine and air); fungus (dry or wet rot or a combination). All three are rendered impotent where there is no material that supports life or combustion. By concrete and steel, New York stopped their depredations.



Streets Table-Top Smooth

WHEN ADAMS DOES THE GRADING

● Out in Wakeeney, Kansas, they can tell you exactly how good Adams Motor Graders are for building city streets. They know, because just one Adams Motor Grader handled all of the grading, oil-mixing and finishing on 54 blocks of new streets in that city.

This project, which involved an expenditure of some $165,000, demanded a lot of the motor grader on the job . . . it demanded the abundant power of Adams dependable International Diesel engine—the precision accuracy of Adams power-operated control system—the strength and stamina of Adams rugged all-welded, machine-finished construction.

Everywhere, progressive cities have found Adams Motor Graders ideal for many municipal duties—for building and maintaining unpaved streets and alleys—backfilling over sewers, water mains, gas pipes, etc.—grading around playgrounds, parks, municipal centers, parking areas, etc.—leveling municipal dumps, etc.

Discover how Adams Motor Graders can help improve and beautify your city—*at low cost.* Your near-by Adams dealer will gladly give you complete information on the machine best suited to your needs.

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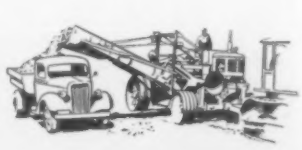
Adams



MOTOR GRADERS • LEANING WHEEL GRADERS • ELEVATING GRADERS

One More Coating

An all-over surface treatment of the streets in Granada, Miss., puts street improvements up to date

THE base makes the biggest difference between a good street improvement and a poor one. And the base spells the difference in cost. Granada, Miss., recognized this in its new street improvement program, and is capitalizing on a strong sub-base to make the present street improvement structurally sound and economically interesting to the property owners.

Most of the residential streets are on clay and have been topped for a number of years with gravel. As time went by this gravel gradually worked its way into the sub-base, giving by natural action a sort of clay-gravel stabilized base. So when City Engineer W. E. Johnson and Street Commissioner J. M. Talbert looked over the streets needing improvement, they took advantage of this strong base, and laid on it a hot-asphalt mat surface.

In the business district, wood pavement blocks had been in place for more than 30 years. These had gradually deteriorated until they were no longer of much service and had to be replaced. The blocks lay on a 5-inch concrete base that was still in fairly good condition; it was decided to repair the base and repave the concrete with hot-asphalt surfacing. This included a 2½-inch binder course followed with a 1½-inch wearing surface, giving a 9-inch over-all pavement. The surfacing and binder were made from local aggregate and AC-8 asphalt, mixed in a Barber-Greene plant.

Certain other streets in new developments, not surfaced in the past with gravel, have been paved with a 6-inch pavement of uniform thickness. Street widths average 24 feet in residential areas; 30 feet, 35 feet, and 40 feet in business sections.

The pavement costs run $2.92 per square yard for concrete, and $1.96 per square yard for the sheet asphalt. Where separate curb-and-gutter is required, the costs went at $1.25 per running foot.

The pavement improvements included about 45,000 square yards of concrete work and about 26,000 square yards of asphalt. The work was performed under contract by the Burdine Construction Company of Greenville, Miss.

Miami's Mechanical Maintenance Crew

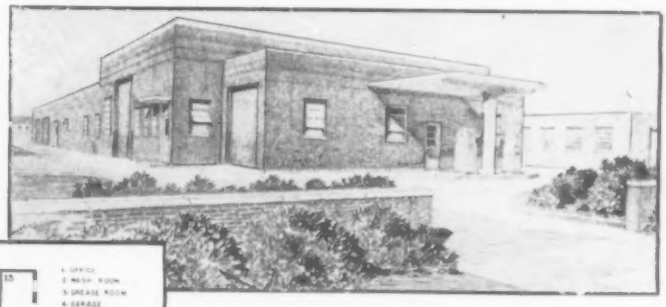
Miami's Scoopmobile, a product of Mixermobile Manufacturers.

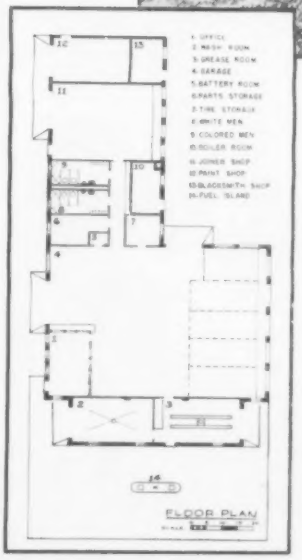
WHERE general park maintenance is concerned, Miami's Superintendent of Parks, Jerry Curtis, has a one-man crew that makes short work of most of the heavy problems. A capable man on a Scoopmobile, he has found, can work over the ball fields, putting them in first-class playing condition, can handle compost piles in one-twentieth of the time that it takes for hand labor, can load soil from playgrounds and park areas, and also load waste materials from these areas when building is in progress.

When he uses it to condition the ball fields, he skims them off with the machine, moving the dirt very rapidly to the points where it is needed. With the excess he loads the trucks to be removed from the premises.

Park maintenance comes under the general direction of the Department of Public Welfare. Jesse J. Yarborough is director.

Newport News Public Works Repair Shop





A NEW repair shop is being constructed for the Newport News, Va., Department of Public Works under the direction of Mr. J. C. Biggins, City Manager, and the immediate supervision of Sol Ellenson, Director of Public Works. The plans were drawn by the Department's staff architect, Lyle Swiger.

The repair shop will include a separate car and truck washroom, a separate grease room, office space, a large garage, and separate rooms for battery storage, parts storage, tires and repair facilities

Building of the shop is being done by the States Construction Co. Newport News, at a bid price of $56,997.

Brown County's 19 radio-equipped snow plows attack Wisconsin's deep drifts. Green Bay is shopping center for 100,000 people and roads in the area must be kept open at all times.

BROWN COUNTY, WISCONSIN, USES G-E 2-WAY RADIO

For Traffic Police • Sheriff's Patrol Cars • Highway Department!

● Once again a tough job is being licked by dependable G-E 2-way radio equipment!

Here's an ideal communication system combining police patrol and highway maintenance. Does an efficient job under difficult conditions and saves taxpayers' money. How?

General Electric 2-way radio serves Brown County police and sheriff's vehicles which patrol 500 miles of county and state highways. Use of these radio communication sets on snow plows, for example, enables these snow fighters to combat storms with maximum efficiency *in less than half the usual time*, say highway officials.

Alert public officials everywhere are asking about the new General Electric radio equipment designed to provide better communication among such departments as:

Police	Highway Patrol	Highway Maintenance
Fire	Snow Clearance	Ambulance
Sheriff	Electric, Gas, & Water Utilities	

Want to hear more?

You can reach a radio communication representative through the G-E office nearest you. Call there, or write: *General Electric Company, Transmitter Division, Electronics Park, Syracuse, New York.*

⬆ Sturdy G-E equipment is conveniently mounted behind boom gear. Coldest weather or stiff winter winds do not affect radio efficiency. Note strong buggy-whip antenna.

⬇ Two G-E remote control consoles are used in the system. This one is in the office of the traffic police chief.

⬇ County police and sheriff's patrol cars carry G-E 2-way radio. Highway vehicles are on same net, enabling officials to coordinate snow clearance, flood control, other emergencies.

⬅ Neat, efficient 250-watt G-E FM transmitter is heart of 3-way Brown County radio system.

LEADER IN RADIO, TELEVISION AND ELECTRONICS

GENERAL ELECTRIC

163-G2M-6810

Refuse Collection and Disposal

Poetic Removal

AN insurance man recently moved into a new house in Oklahoma City. He arranged for refuse collection too late for the pick-up that week. Boxes and other refuse began piling up.

One morning the new resident decided it was time for action, and sent the following telegram to the City Manager:

Roses are red,
Violets are blue,
Garbage pick-up
Ten days overdue.

When he returned home from work that afternoon, he found that the city could rise to the occasion. A telegram signed by City Manager William Gill, Jr., went as follows:

Garbage smells.
Your rhyme does too.
But I've sent for your hog feed
P. D. Q.

The poet went to his backdoor and looked out. His refuse was gone.

Detachable Dumping Units Aid Refuse Collection

THE collection of refuse from the Cincinnati Union Terminal, the zoo, various circuses, and other locations has been simplified with the adoption of a set of Dempster Dumpster loading units.

Cincinnati owns one pick-up unit and five Dempster Dumpster units. With the exception of the Cincinnati Union Terminal, the units are used chiefly during the spring and summer seasons. The Division of Waste Collection, Department of Public Works, locates one at the city's larger bible schools, at the Cincinnati zoo, at any circus that may be performing here, and at the fairgrounds. At the Union Terminal they are used every day and have proved to be very satisfactory. At this central railroad station, the unit and its driver pick up an average of 5,000 pounds of refuse each day in one load. The Terminal Company itself owns a 5-cubic-yard unit. It has been the practice for the city to pick up this container and leave one of its empty units there so that the Terminal Company gets its own container back every other day.

In the specific case of refuse collection at the Union Terminal, use of the Dempster Dumpster units has reduced the labor involved from a total of two or three laborers, plus a truck driver, to one truck driver. Under the old system, the time involved averaged between one-half and three-quarters of an hour to make the pick-up. With the new unit, the truck driver takes between five and ten minutes to drop the empty container and pick up the loaded one. The time involved in servicing the other units at the zoo, at circuses and at the location of other special events is on a comparable basis.

The refuse collection work is under the immediate supervision of R. C. Taylor, Superintendent of Waste Collection of the Department of Public Works, of which R. G. Sarvis is Director. W. R. Kellogg is City Manager.

Fifty Cents Per Month Per Family

ROCKY FORD, Colo., a city of 3,500 people, needed a refuse-collection system, but had no money either to establish it or to pay for its operation. So City Engineer Harry Barnes took it on himself to develop some civic interest in the improvement, and wound up by establishing the service on a healthy pay-as-you-go basis.

His first step was to go to the Chamber of Commerce, and ask it to send out cards to determine whether the people would support a refuse-collection program based on a service charge of 50 cents per month per family. The Chamber made such a survey, and learned that more than 80% of the people questioned favored the move. With public sentiment so clearly voiced, the Council proceeded to draw up an ordinance making the establishment of the collection system possible.

The next problem that faced Engineer Barnes was that of the initial clean-up. This time he called on assistance from the Rotary and Lions Clubs. These organizations voted to donate money to meet the first payroll, and members offered the services of their privately owned trucks in the first clean-up drive. About 40 trucks and 150 men gathered at the city hall last fall and started a drive that lasted for three days. Altogether they hauled away some 715 loads of rubbish, and set the garbage-collection system on a healthy going basis.

It is the practice to collect weekly from residential areas, and daily from the business district. Two trucks are required with one operator and one driver to each truck.

All single-family residences pay 50 cents per month. Larger grocery stores that receive daily service pay $3 per month. The local laundry that contributes a good-sized load of ashes each week pays $10 per month. The bills are added to the water bill for each month. If a residence does not have a water connection, the bill covers only the cost of refuse collection.

One of Cincinnati's detachable dumping units.

STREET PROTECTION AT LESS COST

Outfit moves quickly from one job to another. HD-5 on trailer easily pulled by A-D motor grader.

Allis-Chalmers Brings You A New, Low Cost Plan For Road and Street Upkeep...

No need to make a major investment in equipment to handle various jobs. Any maintenance work . . . and much of your construction . . . is quickly, efficiently done with this versatile combination — AT BIG SAVINGS. There is only a nominal original cost with correspondingly low upkeep . . . but the work accomplished is considerably widened. Take a look at the list of jobs you can do — it's endless! Whatever your maintenance problem, this equipment package will wrap it up at the lowest cost.

WRAP UP YOUR MAINTENANCE PROBLEMS WITH THIS EQUIPMENT PACKAGE . . .

Allis-Chalmers HD-5 Tractor with Tracto-Shovel and Model A-D Motor Grader

All-'Round, All-Year Machine — Besides 1 cu. yd. standard bucket, interchangeable attachments for Tracto-Shovel include ¾ cu. yd. narrow bucket and bucket teeth, 2 cu. yd. snow loader bucket, bulldozer blade and V-type snow plow. Outfit may be used with Gar Wood 2-wheel scraper, too, using shovel hydraulic system.

SOME OF THE JOBS YOU CAN DO WITH THIS COMBINATION . . .
Working Together or Separately

- Clean and shape-up ditches and backslopes
- Handle regular maintenance
- Widen and reshape streets
- Make driveways
- Scarify streets
- Backfill pipe, culverts, bridges
- Take out cuts
- Make fills
- Do all bulldozing
- Plow, move and load snow
- Skid trees
- Load rocks and stumps
- Dig and load dirt or other material
- Mix black-top
- Do crane work
- Handle hauling or pulling

ALLIS-CHALMERS
TRACTOR DIVISION • MILWAUKEE 1, U. S. A.

Airports and Aviation

The Flying Line Inspection

PHOTOGRAPH COURTESY OF LOS ANGELES DEPARTMENT OF WATER AND POWER

Pilot Fred Bowen, in the helicopter chartered by the Los Angeles Department of Water and Power, lands on the roof of the Boyleston Street garage. Line patrolmen who were picked up and landed here scan transmission lines from Los Angeles to Boulder Dam.

VISITORS to the LaGuardia airport observation deck will hear Port of New York Authority plane-by-plane announcements over a public address system of the varying airport activities on Saturdays, Sundays, and holidays from 3 to 7 p.m., according to an announcement recently by Howard S. Cullman, Chairman.

Recent trial programs have been so favorably received by the public that the Port Authority has decided to make the LaGuardia Airport broadcasts a permanent feature of its airport service, Mr. Cullman explained. Victor H. Barden, the LaGuardia announcer, has had an extensive aviation background. As a former control tower chief, he is able to translate for the spectators the instructions the tower is giving to pilots on the field or aloft over shortwave radio. He is familiar with all types of planes and their operation, and his non-technical running account of airport activities is instructive and interesting.

Spectators at LaGuardia during broadcasting hours will be informed of the origin and destination of flights, and types and capacities of planes. Perhaps for the first time, they will learn facts about the instrument landing system and radar equipment at the field.

Can Airports Be Good Neighbors?

CAN airports be built near residential districts without damaging property values? According to a symposium conducted by the Urban Land Institute and appearing in its September *Urban Land*, it depends on the type of airport.

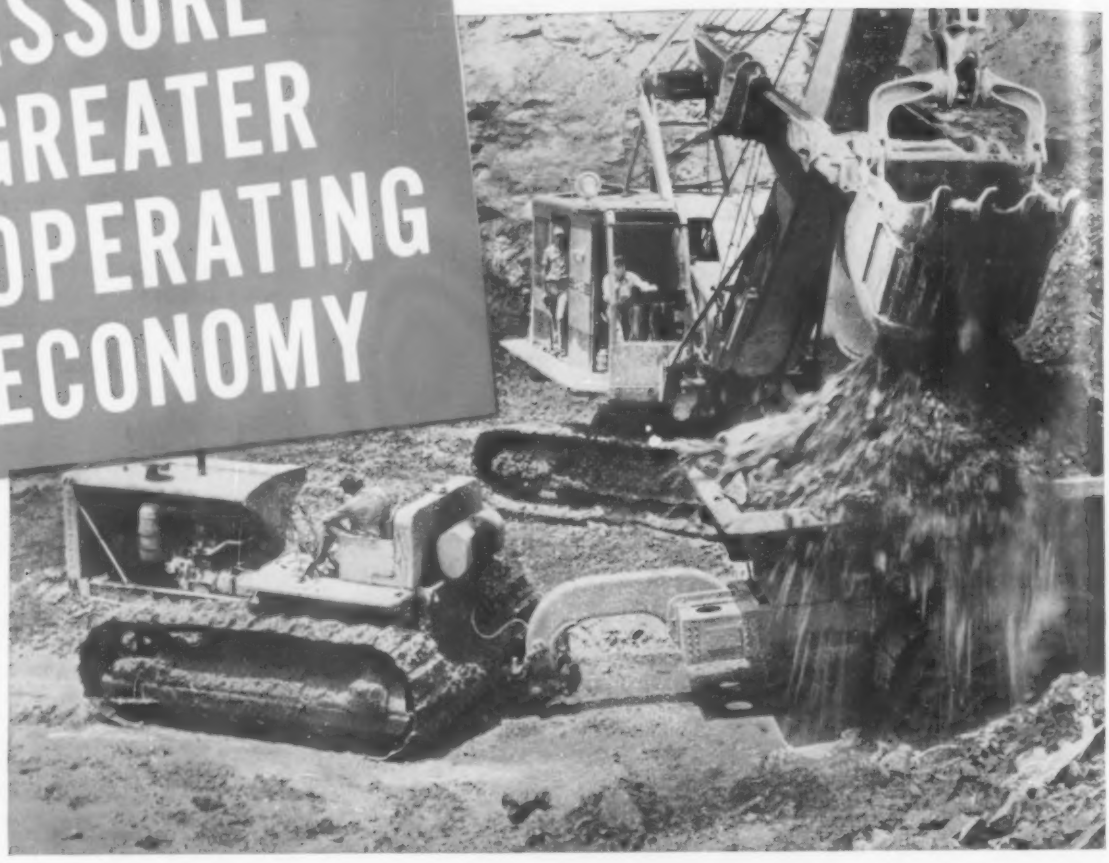
One of the members of the symposium panel, Edward R. Carr, president of the National Association of Home Builders, Washington, D. C., expressed the opinion of home builders when he said that many home owners try to avoid living near active military airports or large commercial airports with many transport planes. The smaller airport can be an asset, he felt, if it is managed correctly. The airport management, however, would gain much good will of its neighbors by moving to the outskirts, buying generous acreage.

The flyer's opinion was expressed by Lowell H. Swenson, executive vice-president of the National Aeronautics Association, who said that builders should exercise the same care in placing developments close to large airports that they would when locating developments near large rail terminals. The airpark, he felt, would be acceptable, since it involves limited business activities and can be compared to provisions for parking or garaging automobiles. The NAS, he said, does not accept the tenet that living adjacent to the small airport is hazardous nor does it feel that airplane noise, particularly from smaller planes, is excessive. He quoted sound tests made at St. Petersburg, Fla., where the noise from a small private plane passing 200 feet overhead was no greater than that of a car about fifty feet away.

J. Burrows Johnson, a real estate appraiser from New Orleans, La., stated that airports have not enhanced real estate values for residential purposes,

Kansas City's proposed international super-airport. Runways will be at least 6,000 feet long and about 200 feet wide; one of 10,000 feet will be for instrument landing. There will be no obstruction to a 40-to-1 glide ratio within a 15-degree angle of any runway. With such dual runways ships can land and take off without waiting. Acreage and improvements will come out of bond issue.

ASSURE GREATER OPERATING ECONOMY



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PUT *Texaco Ursa Oil X*** in your heavy-duty engines – gasoline or Diesel – and reduce fuel consumption and the cost of repairs and maintenance.

*Texaco Ursa Oil X*** is fully detergent, dispersive, and resistant to oxidation. It keeps engines clean . . . prevents deposits of sludge, varnish and carbon that steal power . . . assures free rings and valves . . . protects bearings from corrosion . . . reduces wear. For the best and thriftiest engine operation, lubricate with *Texaco Ursa Oil X***.

For chassis parts of trucks, tractors, graders and other equipment, lubricate with *Texaco Marfak* – the world-famous chassis lubricant that lasts longer on the job . . . seals out dirt and moisture. And give crawler track mechanisms full and lasting protection with *Texaco Track Roll Lubricant.*

To get the best performance . . . most economically . . . from all your equipment, follow the Texaco Simplified Lubrication Plan. For details, call the nearest of the more than 2500 Texaco Distributing Plants in the 48 States, or write:

The Texas Company, 135 East 42nd Street, New York 17, N. Y.

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TEXACO Lubricants and Fuels

FOR ALL CONTRACTORS' EQUIPMENT

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Volume XLIII Number 4
APRIL 1948
The American City

Anderson Uses Horizontal Well Supply

Unique self-liquidating financing system set up to make possible the construction of four radial collectors for Anderson water supply

This is how the finished collectors look. There are four of these in the completed project.

ANDERSON, Ind., is strengthening its water supply on a strictly pay-as-you-go basis. This city has installed four Ranney collectors in a river-fed aquifer, capable of yielding an overage of 12 mgd of water requiring no treatment other than chlorination.

The need for additional water came about through the growth of the city both in industry and population. In the last few years, nearly 15,000 new people have come to Anderson, making it necessary for this city to add nearly 11 miles of water mains, as well as trunk-line mains and fire hydrants. The additional water that these people required, coupled with the fact that the present supply was increasingly unsatisfactory because of its polluted character, prompted a close examination of water resources.

Geological Study Uncovers Good Aquifer

An engineering study, verified by the U. S. Geological Survey, disclosed a satisfactory aquifer in the Killbuck basin. The aquifer, drawing on water from Killbuck Creek by induced infiltration, was found to have a perennial yield of about 15 mgd. The water so extracted is, in effect, filtered by slow sand filtration and tests show it to be bacteriologically pure and free of objectionable tastes and odors.

The Ranney system, selected to ex-

A slotted screen pipe being jacked out of the caisson into the water-bearing stratum. Note the stream of water from the pipe. This is flushing fine sand out of the pipe, leaving coarse gravel around the screen.

A welder secures a digging head to the end of a piece of slotted screen pipe.

ploit this basin, utilizes a caisson 13 feet in diameter, made of reinforced concrete and sealed at the bottom. Extending laterally from the base of this caisson is a set of driven well points, 8 inches in diameter, jacked hydraulically into place. Each of these well points is connected to a screen 200 to 300 feet long. During the development of the collector, the well points are pumped at a very high rate, thus drawing fine sand particles through the well screen and lodging coarse material against it. This in effect makes the entire lateral similar to a gravel-packed well and encourages high yields.

When in operation the water moves from the aquifer to the laterals of the collector at very slow speed. Ranney engineers feel that the large area of screen pipe and the slow rate of water flow insure that the water will enter the laterals without significant pressure drop and the consequent release of carbon dioxide that would normally result in encrustation of the well screens.

To install the collectors, the Anderson Killbuck Corporation was organized under Indiana state laws. This corporation applied to the John Hancock Insurance Company for funds with which to finance construction, the loan being secured by a first mortgage on the corporation's property and an assignment of expected revenue from the sale of water to the City of Anderson.

By this method, the city makes no capital investment, but pays only for the water used, although agreeing to buy a minimum average of 6.5 mgd. The city operates the water-producing system and pays the Anderson Killbuck Corporation according to the following schedule:

First 6.5 mgd at 2.2c per 1,000 gallons
Next 1 mgd at 1.3c per 1,000 gallons
Excess of 7.5 mgd at 0.8c per 1,000 gallons

At the end of a 15-year period the city will purchase the entire water system from the Anderson Killbuck Corporation for $1.00. This will include a clear title to all property, pipelines, collectors, and operating devices owned by the Anderson Killbuck Corporation. The city plans to maintain all of its present facilities intact for standby purposes; thus Anderson will have two independent sources of water supply. The first unit of the new water-supply system went into operation in late August 1947, about four months after construction began. The entire system went into operation, filling Anderson's entire water needs, during the last week of December 1947. The usual difficulties in obtaining materials slowed the progress of the work.

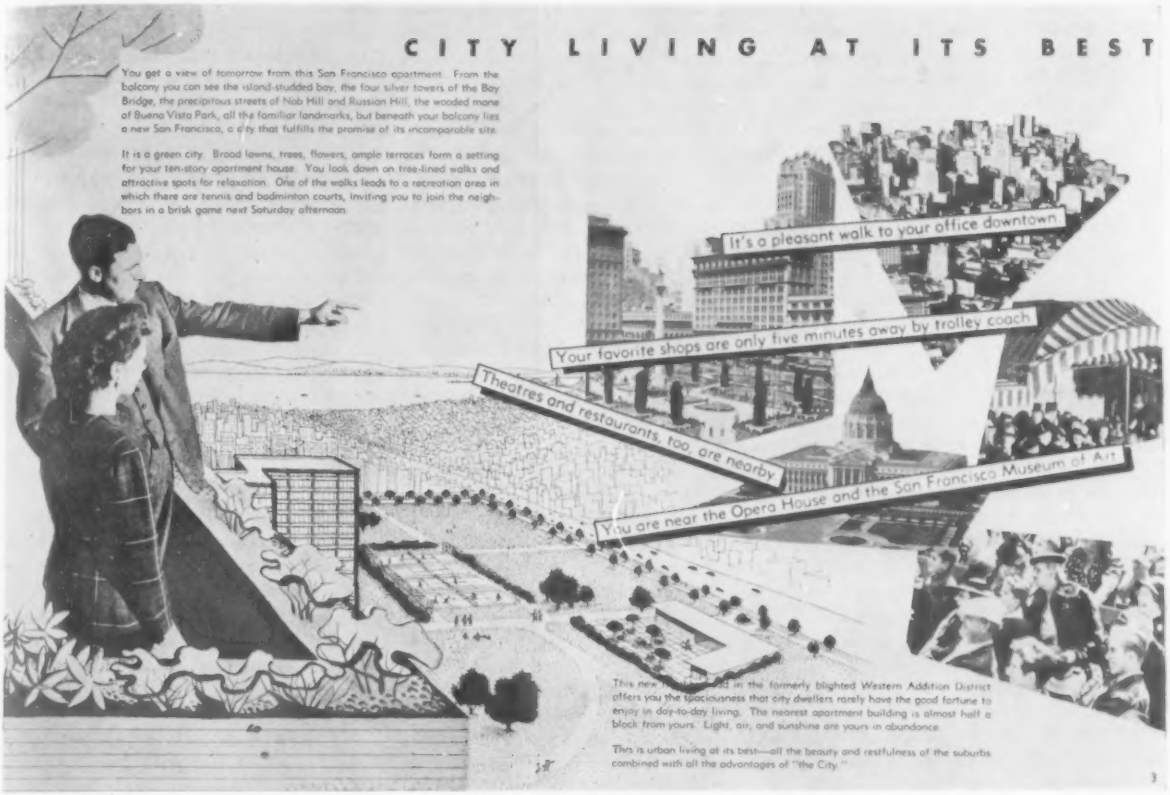
No Rate Increase Required

Inasmuch as the city's average water use is about 7.4 mgd, estimates have placed the return on investment of the Anderson Killbuck Corporation at approximately 4% over the 15-year period. The cost of the new water system is estimated at slightly under $500,000.

The new development will furnish Anderson with an ample supply of water at no increase in consumers' water rates, according to city officials. Furthermore, it will furnish water somewhat softer than the treated White River water. And finally, it will have a more nearly constant year-round temperature than the former White River supply, ranging between 45° and 65° F. in the course of a year.

A Transite transmission main connects the collectors with the rest of the plant.

What's Stopping Urban Redevelopment?


CITY LIVING AT ITS BEST
You get a view of tomorrow from this San Francisco apartment. From the balcony you can see the island-studded bay, the four silver towers of the Bay Bridge, the precipitous streets of Nob Hill and Russian Hill, the wooded mane of Buena Vista Park, all the familiar landmarks, but beneath your balcony lies a new San Francisco, a city that fulfills the promise of its incomparable site.
It is a green city. Broad lawns, trees, flowers, ample terraces form a setting for your ten-story apartment house. You look down on tree-lined walks and attractive spots for relaxation. One of the walks leads to a recreation area in which there are tennis and badminton courts, inviting you to join the neighbors in a brisk game next Saturday afternoon.
It's a pleasant walk to your office downtown
Your favorite shops are only five minutes away by trolley coach
Theatres and restaurants, too, are nearby
You are near the Opera House and the San Francisco Museum of Art
This new [illegible] in the formerly blighted Western Addition District offers you the spaciousness that city dwellers rarely have the good fortune to enjoy in day-to-day living. The nearest apartment building is almost half a block from yours. Light, air, and sunshine are yours in abundance.
This is urban living at its best—all the beauty and restfulness of the suburbs combined with all the advantages of "the City."
3

This picture is from the booklet, *New City: San Francisco Redeveloped*, published by San Francisco Planning Commission. Based on a technical report, "Western Addition District Redevelopment Study," it dramatizes redevelopment problems.

California's problems are typical of those in cities throughout the land

By MEL SCOTT
Planning Consultant

WHEN the California Legislature enacted a community redevelopment law in 1945, city planners, many civic leaders, real-estate and construction interests, and progressive legislators looked forward to the reclamation of the blighted areas of California cities. To date, however, not a single city in California has been able to undertake clearing and rebuilding of deteriorated districts. Now the press, socially conscious segments of the public, and enlightened legislators are asking "What is stopping urban redevelopment?"

It would be an exaggeration to say that Californians generally are clamoring for the rebuilding of blighted areas. Most real-estate groups and builders currently are far more interested in creating peas-in-a-pod dwellings in suburban tracts than they are in addressing themselves to the thorny problems of urban decay; and thousands of city dwellers are a good deal more intent on escaping to little "dream houses" in Mortgage Manor than they are on bettering the urban environment.

Los Angeles planners report that real-estate, construction, and financial organizations in southern California display little interest in redevelopment of blighted areas because there are still thousands of acres of open space to exploit in that part of the state.

In San Francisco, a city with negligible resources of undeveloped land, there is, on the other hand, considerable concern with the mechanics of eliminating blight. San Francisco, having more to gain by the rebuilding of run-down districts than perhaps any other California city, may be the first municipality in the state to carry out a redevelopment program. On the recommendation of its City Planning Commission, the Board of Supervisors recently adopted a resolution requesting Mayor Elmer Robinson to appoint a redevelopment agency. As this article goes to press, the Mayor has declared that he will soon announce his appointments.

Serious Problems Facing New Agency

But the new agency will be unable to move ahead until it finds the answers to half a dozen serious problems: high land costs, high construction costs, housing for displaced families, constitutionality of the California Redevelopment Act, racial discrimination, and citizen unfamiliarity with the procedures involved in clearing and rebuilding blighted areas. These, generally,

are the same problems that confront leaders in the field of redevelopment in cities throughout the land.

In an effort to determine exactly how much the city might accomplish under the Community Redevelopment Act of 1945, the Board of Supervisors of San Francisco last year voted a special appropriation for the City Planning Commission to enable it to explore the possibilities of applying the Act to the redevelopment of one of the city's largest blighted areas, the Western Addition District.

Characteristics of Fire

This two-and-a-quarter-square-mile area escaped the catastrophic fire of 1906, but some San Franciscans contend that the disaster nevertheless contributed to its decline. With thousands homeless and shelter at a premium, some property owners saw an opportunity to convert their homes into rooming houses or to divide them into numerous small apartments, often in violation of health and safety regulations. As neighborhoods became less desirable, older families moved to newer sections; immigrant and colored groups moved in. By 1930 the District had all the characteristics of a badly blighted area—indiscriminate mixture of residential, commercial, industrial, and institutional structures; a high proportion of substandard dwellng units; inadequate recreation space, and an excessive amount of crime, disease, welfare cases, and serious fires.

Yet the Western Addition District is close to San Francisco's central business area and lies just west of the sumptuous Opera House, in which the Charter of the United Nations was adopted. From hills in the District there are magnificent views of the downtown skyline and the island-studded bay. The city fathers rightly concluded that no blighted area in the city was more suitable for a pilot study that would reveal limitations as well as strong points in the state law.

California urban redevelopment legislation provides that the community may activate a redevelopment agency to acquire sites, if necessary through eminent domain, within redevelopment areas designated by the local legislative body after public hearings. The agency has power to clear and prepare sites for sale or lease to private enterprise to develop in accordance with plans conforming to the Master Plan of the community but is specifically prohibited from itself engaging in any building operations.

The requirements that the community must have a planning commission and a master or general plan officially adopted by the commission or the legislative body are among the best features of the California statute. Likewise, the requirement that redevelopment plans must be in harmony with the over-all community plan is excellent.

But the study made under the general direction of T. J. Kent, Jr., San Francisco's brilliant young Director of Planning, disclosed that one of the principal financial provisions of the California law is a roadblock to redevelopment. This section stipulates that no property bought out of a revolving fund created by a general obligation bond issue can be sold at less than 90% of the price paid for it, unless the community first approves by a majority vote. At the time the Act was passed, proponents of redevelopment believed that a 10% write-off would be sufficient to reduce the price of most blighted properties to a figure that private enterprise could afford to pay. Rarely would a redevelopment agency, it was thought, be obliged to wage a political campaign in an effort to convince voters that the community could afford to absorb a greater write-off on blighted properties.

Californians who are anxious to initiate redevelopment now recognize that the 10% write-off is unrealistic in these inflationary times. They declare that the Community Redevelopment Act must be amended to provide for a more liberal write-off that will not necessitate the expense and struggle of an election. A financial analysis in the San Francisco study demonstrated that with construction costs ranging from $9 to $22 per square foot for reinforced concrete structures, even a 75% write-off on centrally located blighted properties would barely suffice to bring rents in redevelopment projects within reach of families of moderate income. Tax freezing, permitted in New York State, is no alternative in California because the State Constitution prohibits it.

Federal and State Funds Essential

It is doubtful, however, whether any cities, even in prosperous California, could finance large write-offs unaided. The redevelopment study of the San Francisco City Planning Commission found that federal financial assistance to cities will be necessary if blighted areas are to be rebuilt. But federal funds will not necessarily eliminate the need for state funds, since any federal urban-redevelopment legislation enacted undoubtedly will require communities to provide a fourth, a third, or even one-half as much money as the federal government allocates for land assembly. In view of the heavy demands upon the treasuries of rapidly growing California cities, the state should supply some funds to communities to enable them to meet federal requirements.

In drafting the Community Redevelopment Act, the California Legislature empowered redevelopment agencies "to borrow money or accept financial or other assistance from the federal or state governments," but appropriated no funds to aid such agencies. Its failure to do so presents a familiar situation: "Hang your clothes on a hickory limb, but don't go near the water."

Whether California legislators eventually will be disposed to supply funds to help communities rebuild blighted areas remains to be seen. At a recent Legislative committee hearing one key solon asserted that the Community Redevelopment Act should never have been passed in the first place, and that it certainly should not have been amended last year to create a limited-tenure State Redevelopment Agency, a technical organization to assist cities in formulating redevelopment programs.

A Solomon Needed

Expressing his opposition to a budget that would permit this infant agency to operate during the next fiscal year, the lawmaker growled, "We don't want to put the state permanently in the housing business. That would just encourage a lot more people to come to California and make the housing shortage worse than ever."

Only a Solomon could determine whether financing or the housing shortage constitutes the greater barrier to community redevelopment in California. An unceasing tide of in-migration swamps the state, now chock-a-block with more than 10,000,000 people. Somehow, everyone finds shelter, in war housing or trailer camps or with relations, but how to relocate any considerable number of families so that a blighted area could be cleared is a problem that has everyone baffled. Until some one finds a solution, redevelopment in California is stymied. The law specifically protects families in blighted areas from being displaced until there is adequate temporary housing available at rents comparable to those they are paying. Furthermore, within a three-year period permanent housing must be available at rents comparable to those obtaining at the time of their removal.

The San Francisco study pointed out that expansion of the public low-rent housing program would make possible relocation of some low-income families from blighted areas. But since a high proportion of families in the Western Addition District would not be eligible for public housing, the public program cannot be considered a complete solution to the relocation problem. The study was careful to emphasize, however, that private-enterprise redevelopment projects and public housing must

both be included in a comprehensive, city-wide housing program.

In San Francisco, as in some eastern cities, the racial issue complicates the relocation problem. Although a sample survey conducted as part of the Western Addition District redevelopment study revealed that the population of the area is predominantly white, it does contain one of the largest concentrations of colored people in the city. Of the District population 26% is Negro, 4% Japanese, 5% Chinese and other races. As most of the city is now barred to these minority groups by restrictive covenants, they have an understandably fearful reaction to the thought of being displaced. Much credence is given to wild talk that redevelopment is merely a scheme to oust the Negro population. At public meetings Negro leaders point out that a non-discrimination provision in the original draft of the Community Redevelopment Act was deleted before the Legislature would approve the measure. "Are redevelopment projects going to be for whites only?" minority spokesmen ask.

Most public officials have avoided taking a position on this issue, but one thing is certain: minority groups will flatly reject the socially undesirable pattern of segregation and will take legal action to block construction of any project that would be operated under a discriminatory rental policy.

Because no city in California has yet undertaken to assemble land for redevelopment, the constitutionality of the Community Redevelopment Act has not been determined. Its similarity to acts that have been upheld by Supreme Courts of other states encourages California planners to believe that it will be declared valid.

The conclusion that seems inevitable from a review of the situation in California is that city officials and civic leaders should intensify their efforts to acquaint the public with the precise problems that block redevelopment. Many citizens want blighted areas improved, but fail to see how they themselves can play a part in bringing about action. A good many still regard the law as a hocus-pocus for taking land from one group of property owners and selling it to another. Until there is clear understanding by a majority of voters of the benefits to be gained by eliminating blighted areas and of the kinds of financial and legal tools necessary to do the job, there will be no effective demand for state legislators and congressmen to amend existing laws and to enact new ones, so that city rebuilding can get under way. The proponents of redevelopment have won a few initial engagements, but they are far from having won a campaign.

Sunday Supplements Carry Wichita's Annual Report

By PAUL E. DANNELLEY
Research Aide
Wichita, Kans.

INSTEAD of the conventional booklet report, the City of Wichita has used the Sunday supplements of the two local daily newspapers to present its 1947 story to the people. These 8-page tabloid sections—titled, "We, The People" in *The Wichita Eagle* and "Municipal Services—1947" in *The Wichita Beacon* —appeared in the issues of February 22, 1948.

Space costs for the two sections, paid at legal rates, were comparable to printing costs for the customary booklet, and the total circulation was roughly 16 times as large.

"We, The People," pictorially illustrated, employed magazine make-up, with varied column width. The title originated from the cover picture (reproduced on the front cover of this issue of THE AMERICAN CITY.)

"Municipal Services—1947," employed standard tabloid make-up, with five newspaper columns on each page. Cover illustration included eight photographs in a sort of montage arrangement.

Both sections were prepared with the intention of encouraging greatest possible readership, even on many subjects which ordinarily interest only a small percentage of the voters.

Copy carried in the two sections was almost entirely different and there was only about 10 per cent repetition in photographs.

The idea for the tabloid technique in annual reporting was conceived by City Manager Russell E. McClure, who after 6½ years of service to Wichita, became a city manager at Dayton, Ohio, last month.

Wichita's excellent monthly reporting system for all departments in the city government made copy a job of writing and editing rather than a job of research. Department heads prepare accurate and detailed monthly reports which are summarized in a "covering letter" which accompanies each report. The monthly reports were incorporated rapidly after January 1 into departmental annual reports, totaling about 150,000 words, which became source material for newsworthy information to be included in the tabloids.

This reporting system, coupled with the city's relatively new photographic file, maintained by the Research Division, made publication of the report possible within 53 days after the first of the year.

Wichita places considerable stress on municipal reporting. The city has one regular radio broadcast (weekly) and two others which were heard during a part of 1947. The regular broadcast, "Your Mayor Reports," features a weekly discussion of some phase of Wichita's city business. The city prepares a regular schedule of news releases which supplement the excellent coverage accorded the City Building by newspapers and radio stations.

"Special reports, leaflets, brochures, "open-house" activities and preparation of special addresses highlight the broad municipal reporting pattern.

David D. Rowlands, Planning and Research Assistant, earned his M.A. in public administration with a thesis on the uses of radio and movies in municipal reporting.

M. P. Jones, Wichita's new City Manager, won the coveted Louisville award last year for the "Accounting Procedure Manual," which reflected outstanding work in municipal finance.

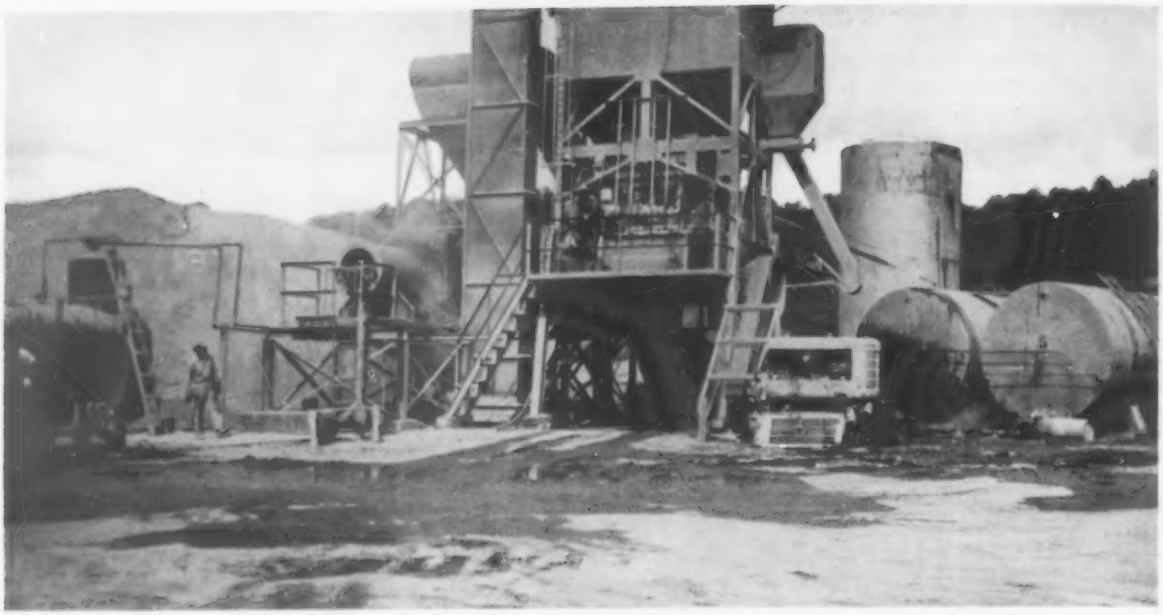
City Manager Jones plans an expansion of the city's leaflet program in municipal reporting, and he is also laying tentative plans for developing the newspaper tabloid technique for next year's annual report.

Saving Money and Time in Building Code Publication

THE official medium for the legal advertising of the City of Toledo, Ohio, is *The Toledo City Journal*, which also serves as a combined house organ and community-municipal news magazine.

About 15 months ago the city adopted a new building code which had to be given legal publication in the *City Journal*. The Commission of Publicity and Efficiency decided that in making this legal publication, the type should be handled so that it would be available also for publication in the city code then being revised. The type that is used for legal publication of subsequent amendments is also lifted for the reprinting of code pages.

In order to provide code purchasers with up-to-date information as to amendments, Russell Bremer, Secretary of The Commission of Publicity and Efficiency, has arranged to supply the revisions in loose leaf form, without charge, to persons who subscribe for *The Toledo City Journal* at $1.00 a year.



The asphalt concrete for the street construction program at Oak Ridge was mixed at this plant.

How Oak Ridge Street Program Grew

A network of streets for what maybe the world's most important city

OAK RIDGE is a name to conjure with these days. Originally it was nothing more than an area, a location in Tennessee. To the north was Poplar Creek, west of the community of Wheat. To the south was what the people called Black Oak Ridge. When leading scientists of the democratic world pooled their knowledge to produce nuclear fission that led to the spectacular atom bomb, our government set aside this wooded area for their workshop. And they gave it the disarming name of Oak Ridge for the distinct purpose of keeping its important identity secure.

But for all its important mission, not only to protect the democratic way of life but to unfold new and richer possibilities for our peaceful life, a community of some sort had to be formed, and, even more prosaically, streets had to be built. Because these streets had some points of interest, because they offered the designer the opportunity to do what he wished in order to make these streets function most effectively, this article will dwell on one of the most commonplace functions in the world's most dynamic city.

As observed previously, the Ridge is heavily wooded. This permitted the city planners, Skidmore, Owings and Merrill, to lay out a picturesque community

This rubber-tired Caterpillar tractor handily carves out the street gutter line.

An Allis-Chalmers tractor pulls a power blower that cleans the pavement surface.

among the hardwoods and the conifers.

Planners place the city streets and engineers must then build them. When these streets wind and twist among the hills and valleys, the engineers must use great ingenuity to establish favorable grades and locate convenient building sites.

In this case, however, the planning made possible economical street construction. They were laid out to follow the contours, a procedure which minimized grade operations and cost, and expedited completion of streets for the fast-growing town.

This planning also did something else. By allowing the streets to follow their natural paths around the hills, the planners automatically eliminated most of the conventional right-angle intersections. There are some, however. The principal north-south thoroughfares lead up-grade from the three parallel arterial streets, along the crests of rolling hills or spurs, and connect with second arterial streets extending along the ridge top.

The main thoroughfare looks like this today. The median strip makes the direction of traffic easy.

Street Nomenclature

It is one thing to have winding streets picturesquely located. It is another to have a street system function, so that if a person is given a house number and a street name, he can go there without getting lost. The planners took the confusion out of the street locations by a clever bit of naming. They designated those principal north-south thoroughfares and the three principal east and west streets as avenues. The connecting roadways they called "Roads"; loops returning to the same road at a different point, they designated as "Circles"; and dead end streets were identified as "Lanes" or "Places."

The street naming is simple and efficient. The alphabetical system prevails for all but the three east-west arterials. Here is an example: All streets leading from Kentucky Avenue have names beginning with the letter "K," as for example: Kelvin Lane, Kenwyn Road, Kimball Lane, Kingsley Road, Kingfisher and Keystone then intersect from a a point where Kingsley and Kenwyn meet head on. Similarly the names of circles, roads, and lanes progress alphabetically from north to south or east to west with the same first letter as the parent street.

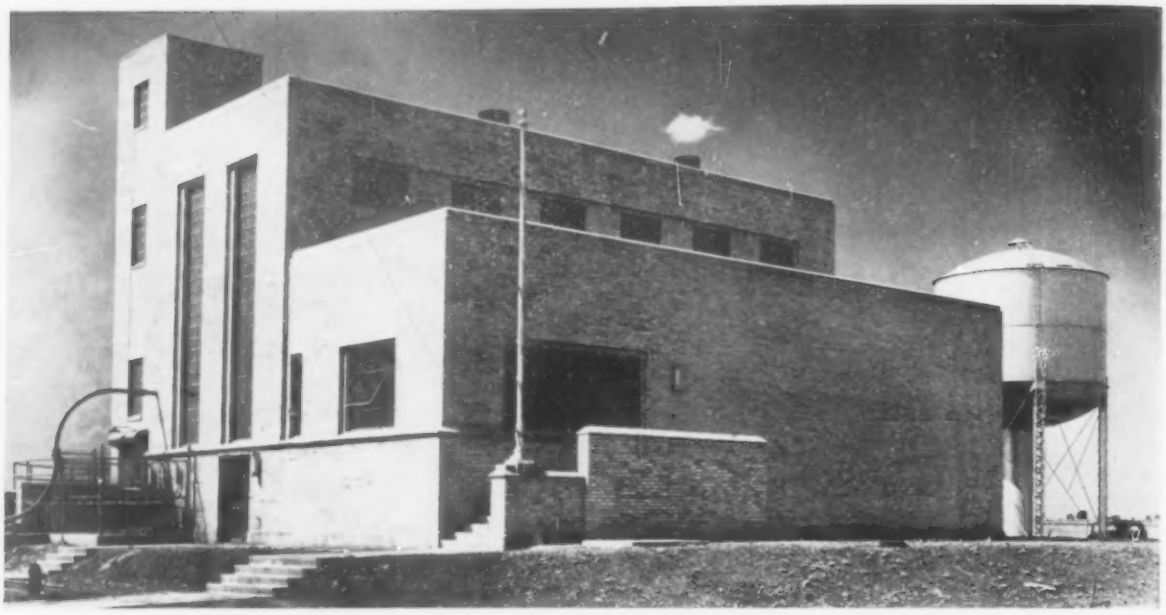
When it had been determined that the city would continue as a permanent installation, there was need for a permanent pavement with curb-and-gutter sections and adequate draining facilities. This was designed to utilize to the fullest extent the existing pavement consisting of crushed-stone base with a light bituminous surface course. On the main thoroughfares four-lane pavements were constructed with transition lanes located at bus stops, allowing passengers to be discharged or taken on by buses or other vehicles, thus permitting vehicles to be completely outside main traffic lines. A new surfacing was required that would be the quickest to place, because traffic had to be accommodated continuously. A hot asphaltic concrete surface course was selected as best suited for this and all other uses.

The completed pavements were properly marked for pedestrian cross-overs and traffic, with center-strip paint containing reflector beads for reflecting properties at night as well as day.

The entire business section and heavily traveled thoroughfare are equipped with properly synchronized electric traffic signals.

A Buffalo-Springfield roller puts the finishing touches to the bituminous mat surfacing the street.

A Barber-Greene paving machine dispenses the asphalt surfacing and lays it to a firm, true grade.



Marshall's new softening plant.

An Eight-Mile Search for Water

Marshall, Mo., population 8,000, ends a 40-year water famine by developing a new well field and building a modern treatment plant

By L. E. STARK
Superintendent, Water and Electric Utilities
Marshall, Mo.

AS EVERY water-works man knows, dependability is a factor that his water users take for granted. Most people know what they want to come out of the household faucets. They want a product that is pure without an offensive taste, colorless, and reasonably soft; above all they want it to be available whenever they turn the handle of the faucet. But few of them realize the trouble that they can present to the water-works man with these specifications.

Since the public demands it, the water-works man must provide a supply to meet it, even though it means a project of major proportions. It did in Marshall. It took a geological study that ranged to a well field eight miles away. It required an engineering analysis that resulted in a water-softening plant with treatment that made the water non-corrosive. And it produced a yield that made the water adequate to meet our needs for many years to come.

Good Water Scarce

Marshall is located in an area where good water is scarce. For a half century the people have known this. The realization of this scarcity prompted them to purchase their water system in 1901, and thereby assume responsibility for its development

At that period, the city drew water from a set of wells located on the east city limits. The operation of these wells set a pattern for the balance of the wells nearby. They produced adequately for a few years, gradually decreasing in yield until, in 1916, officials had to look elsewhere for water. The well depths had to be limited to 130 feet, because below this the area is underlaid with a heavy concentration of chlorides.

A Search for Water

After 1916, the city began its wandering search for more adequate locations. The water department acquired land in different spots to the west and drilled wells in 1919, 1920, 1928, 1936, 1940, and 1944. We have had to abandon completely all wells except those acquired in 1936, 1940, and 1944 because of lack of static water head to support a well. Actual field tests indicated the static water level to be lowered as the well was pumped out. We found that when a new well was drilled, the depth of water ranged from 30 to 35 feet. After a few years of pumping, this head would only be 10 to 12 feet. Wells unsuited for pumping were becoming more frequent. Until recently, pumps delivering 150 gallons per minute could be used on certain wells. At present, the maximum pumping rate of the 13 wells available today is approximately 600 gallons per minute. If they are pumped faster than this, they will break suction and pump air.

For nearly 20 years the people of Marshall have known that they were going to have to look elsewhere for an adequate water supply. In 1928, the Board of Public Works retained Henrici Lowery, consulting engineer, who advised them that another source of supply was inevitable if the production was to keep abreast of water use. Since then it has been a constant battle to keep the mains wet. In the early days the average pumpage was less than 100,000 gallons per day. Today the peak is approximately ten times as great. The average use of water, incidentally, is 60 gallons per capita or slightly over half that in most cities.

Furthermore, this small quantity of water has been of poor quality. It has been uncomfortably hard, ranging from 325 to 350 ppm calcium carbonate, about one part per million of iron, and with chloride running around 25 to 30 ppm, although they have run as high as 400 ppm. The excess chlorides caused an unpleasant taste, and the lack of water put the town in constant danger in the event of fire. The iron stained clothes and caused trouble in the plumbing fixtures.

Treatment Failed

In 1927 the Board removed the excess iron with an aeration treatment through a set of spray nozzles. In 1932 it went further and installed a zeolite softener at the treating plant. The design of the softeners was on the basis of 450,000 gallons per day, reducing water with 200 ppm total hardness to zero. This amount of softened water was then proportioned back with raw water to yield a finished water with roughly 80 ppm. This gave fair results for a time, though the capacity was somewhat reduced by treating water harder than 200 ppm. Then, as the quantity of well water dropped, the plant no longer had the capacity to furnish water to backwash the filters. The softener had to be abandoned.

Such experience with the water supply culminated in the Board's retaining Black and Veatch to recommend an answer. This firm took cognizance of the inadequacies of local groundwater supplies previously listed and the difficulties involved in developing a surface supply, together with our people's preference for well water. With the State Geological Survey, their engineers located a field of groundwater of more favorable characteristics some eight miles northwest of the city.

Their population studies indicated that Marshall might be expected to grow to 15,000 in 1980, and that very likely the water use would grow to 125 gallons per capita instead of its present 60 gallons. With these thoughts in mind, they concentrated on a supply able to provide 4 mgd.

New Plans Drawn

Early in 1945, plans and specifications were begun on the treatment plant and supply line. In order to provide a firm capacity of 1.5 mgd with one well out of service, three 750,000-gallons-per-day Layne Western gravel-wall wells were drilled. Each was provided with a turbine-type motor-driven deep-well pump. To connect this well field with the present system is a 12-inch cast-iron pipeline. In order to meet present water shortages, two of these wells were immediately placed in service, using a gasoline engine with a right-angle gear head and shaft.

Water from the new wells contained a hardness of 225 ppm and an iron content of 0.3 to 3.0 ppm. Free carbon dioxide up to 8.0 ppm is recorded, with a pH test showing 7.6. On this basis it is reasonable to expect that the water would be somewhat corrosive, and that consequently it would be a good plan to locate a treatment plant at the site of the wells in order to protect the pipeline from excessive tuberculations and the growth of iron organisms. There also is a railroad line available for the delivery of chemicals and disposal of sludge is not so great a problem as it is in the city. The new treatment plant treats the water by indoor aeration, lime and soda-ash coagulation, recarbonation, and filtration. The aerator is of the conventional coke-tray type with a perforated stainless steel distributing tray. A vertical forced-draft tube is connected to a 2,000-cfm exhaust blower; air is drawn through the falling water and discharged outside. Some iron is released here with the reduction of the dissolved carbon dioxide.

From the aerator the water enters an Infilco Accelator 40 feet in diameter and 18 feet deep. The basin size selected was based on a rise rate through the sludge blanket of 1.5 gpm per square foot and a total capacity of 2 mgd. Following this slurry type of softener, there is a recarbonation chamber where carbon dioxide from an oil burner will be added. This chamber has a theoretical retention capacity of 10 minutes.

From the recarbonation basin the water enters the final coagulation basin, where alum may be added. The basin provides one-hour retention based on 2.0 mgd rate. Before leaving this basin, the water passes over a second carbon-dioxide grid which changes any remaining carbonates to bicarbonates. After passing the final coagulation basin, the water will flow onto the filters. Two filters are provided with a capacity of 1 mgd each, based on a 2-gpm-per-square-foot rate. The underdrains are of the Leopold block type. A set of Ludlow hydraulic valves operated by Bacharach filter controls governs the filter operation.

Wash-water facilities consist of one 300-gpm Fairbanks-Morse horizontal split-case pump directly connected with a 7½-hp 440-volt electric motor discharging to a 50,000-gallon Chicago Bridge and Iron elevated wash-water

View of the chemical-handling room. Pneumatic line-handling equipment is at left. At right is alum feeder.

Softening action takes place in this upflow clarifier that operates on the suspended sludge-blanket principle.

storage tank. Pumping facilities for delivering the water through the pipeline to town consist of two 1,050-gpm Fairbanks-Morse electric high-service pumps. Duplication of these two units is required in order to provide a firm capacity of 1.5 mgd. These pumps take suction from a sump located immediately below the final filters, pumping directly into the 12-inch flow line to the clear wells at the city end.

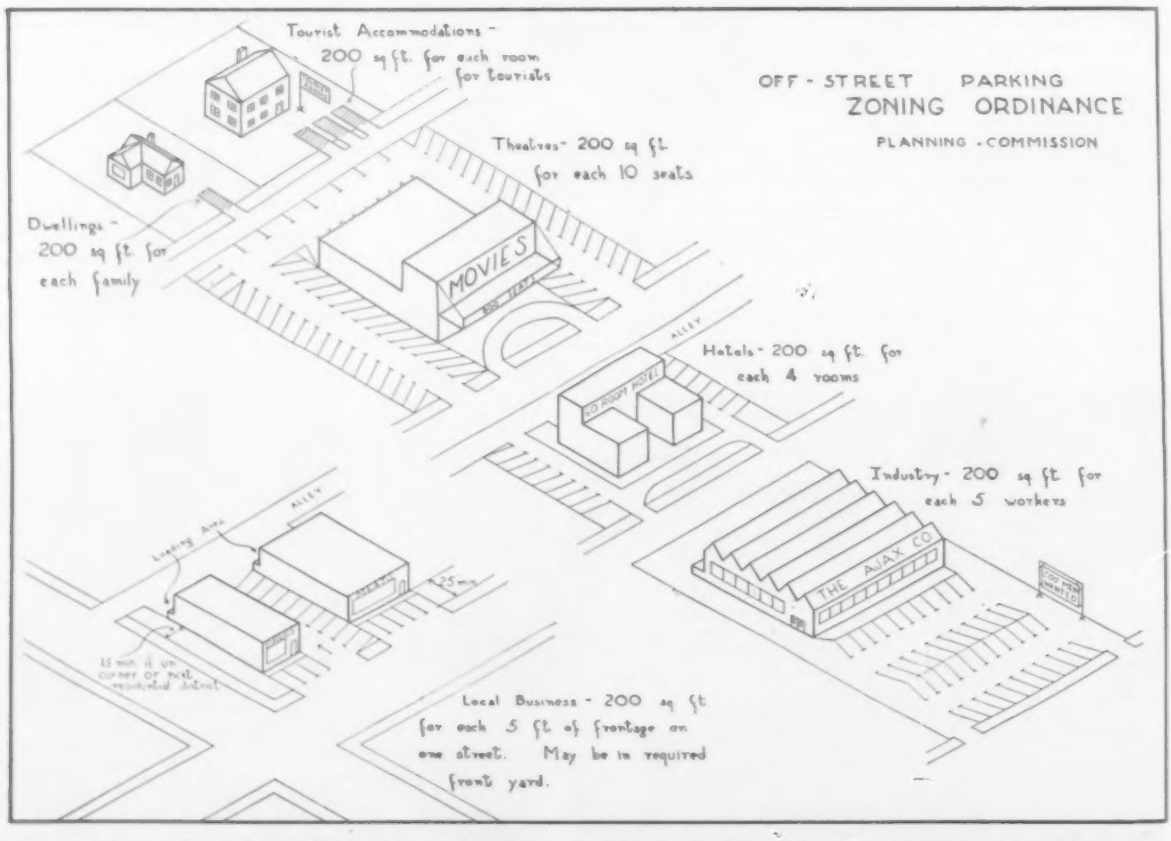
Chlorine is added to the clear well and again at the storage reservoir in the city. At the plant, prechlorination may also be used. The plant has a Leeds & Northrup pH indicator-recorder with sampling points throughout the process. A plant-control valve to balance low-service in-pumpage against high-service pump output is provided. Sludge is disposed of by ponding with the wash water in adjacent acreage; it can also be dried on sand beds.

In order to provide for the use of bulk lime and one-man operation, the designers arranged for Dracco pneumatic lime handling equipment. Lime will be transferred from railroad cars adjacent to the plant to a 60-ton steel storage tank located immediately above the lime slaker and feeder. This equipment will have a capacity of five tons per hour and is of the "push-pull" type. Alum and soda-ash are received in sacks and unloaded from cars and trucks onto a dock adjacent to the building. An elevator of 2,000-pound capacity opening onto the dock will be used to transport the sack materials to the chemical storage room on the upper floor.

Construction has proceeded satisfactorily. The contract for the 8 miles of 12-inch line was awarded in June of 1945, and was completed on April 10, 1946. The treatment plant contract was awarded in November 1945. The work began on March 8, 1946, and was completed on September 8, 1947. The wells were all drilled and completed in June 1945. The total cost of the project has been $620,000, of which $450,000 was provided from general obligation bonds; the remainder was furnished from accumulated earnings of the water utility.

For the first time in the history of Marshall, the people have available to them a plentiful supply of good, potable water. At the same time they have greater protection against fire and a supply of water that meets taste, odor, and softness requirements. The user accordingly has a greater confidence in what he will receive when he turns the handle of the faucet, and the officials of the Water and Electric Utilities can sleep without dreaming of where to drill new wells.

Zoning for Off-Street Parking


Tourist Accommodations - 200 sq ft. for each room for tourists
OFF - STREET PARKING
ZONING ORDINANCE
PLANNING - COMMISSION
Theatres - 200 sq ft for each 10 seats
Dwellings - 200 sq ft for each family
MOVIES
ALLEY
Hotels - 200 sq ft for each 4 rooms
Industry - 200 sq ft for each 5 workers
THE AJAX CO
Loading Area
ALLEY
125 min.
Local Business - 200 sq ft for each 5 ft of frontage on one street. May be in required front yard.

This sketch, reproduced from *The Tennessee Planner*, a periodical of the State Planning Commission, visualizes some of the off-street parking provisions required in the Zoning Ordinance of Athens, Tenn. The sketch does not represent any existing area, but simply shows the amount of space that different types of establishments must provide. An ordinance of this type will go a long way toward minimizing congestion on the streets as a community grows.

What Westchester County did to fit a government-built airfield to civilian use

Civilian Hangar for Military Airport

LIONEL FREEDMAN: PICTORIAL SERVICES

This hangar is the nerve center of the Westchester County airport.

HOW to "rehabilitate and readjust" an airport was the problem that faced Westchester County, N. Y., at the conclusion of World War II. The problem arose when the county came into possession of the government-built airfield located five miles northeast of White Plains. With it came the added problem of utilizing its three modern runways and adjacent taxiways make a functional airport that would be of maximum use to the community. The runways and taxiways, capable of handling the largest and most recently developed aircraft, represented the total facilities on the field.

James C. Harding, County Commissioner of Public Works, fully appreciating the potential value of a modern airport to the community, set about the task. The county authorities decided that such development could best be accomplished by private enterprise, and accordingly leased the property to the County Airport Corporation. The Department of Public Works and County Airport Corporation representatives consulted the Luria Engineering Corporation, of New York City. After a careful analysis of their requirements, a mutual agreement was reached on the preliminary design of a hangar capable of accommodating private and commercial planes up to the size of the DC-4, as well as providing ample office and shop space. The "Luria Standard Hangar" was found to be readily adapted to meet all their basic requirements efficiently and economically.

Uses Rigid Frame Design

In final design, the rigid-frame Luria Hangar provides 16,800 square feet of open hangar space readily accessible through horizontally sliding doors 120 feet by 20 feet. Two 2-story lean-to's of standard design, each 20 feet wide, flank the full 140-foot depth of the basic hangar and provide space for the multitude of operational facilities necessary to the function of a modern airport. A special control tower was designed by Luria as an integral part of the building; it rises gracefully from the lean-to, maintaining pleasing architectural conformity, enhanced by brick facing of all walls. The tower is air-conditioned with acoustic-type ceiling and affords unrestricted vision through windows of heat-absorbing glass. The base of the tower contains a complete installation of the most advanced communications equipment, including an instrument-landing system.

Today the Westchester Airport is in full operation. Plane movements run almost 25,000 a month. The field is used by major airlines for scheduled flights, private plane owners, firms engaged in instructional charter and non-scheduled air carrier activities, and by other major airlines as a standby terminal for New York ports.

The Luria structure affords complete operational, administrative, and maintenance facilities for the field—comfortable waiting rooms, lunch counters, an attractively furnished restaurant, locker rooms, stockrooms, and engine, fabric, and paint shops. It is the nerve center from which all operational controls radiate, and the focal point for all commercial, social, and recreational functions. It provides the utmost of service and comfort to those using the port and will provide proper accommodations for whatever additional activities may be desired.

A Few Elements in Check-Valve Operation

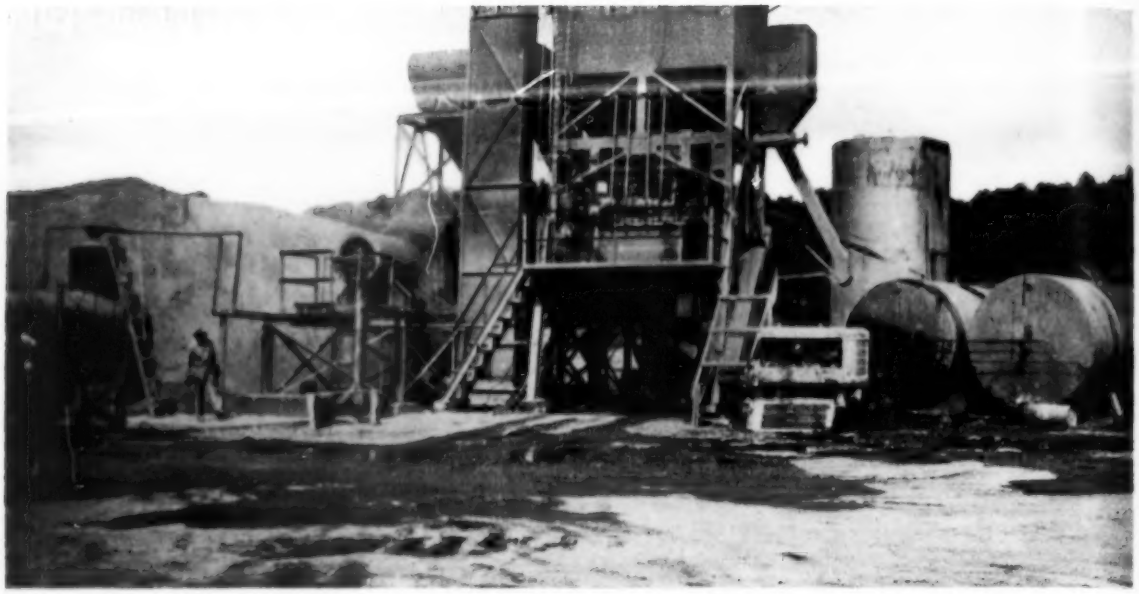
TESTS indicate that water hammer is caused by sudden stopping of a column of water. Its intensity is governed by the velocity of water travel and the speed of valve-closing. The energy exerted by stopping the flow is taken up in the piping and the equipment. If great enough, the actionn causes damage and, very likely, disagreeable odors.

Water hammer creates a pressure of 54 pounds per square inch for each foot-per-second of velocity that is stopped by the valve. Thus with the instantaneous closure of a valve carrying water traveling at 10 feet per second, a pressure of 540 pounds per square inch would be created. Where dead ends exist, as is the case with check valves, this pressure may increase tremendously.

In general, air chambers used in connection with water hammer caused by check valves have not been satisfactory.

Water-hammer action can be minimized by quick-acting check valves. After driving force ceases, when the motor driving a centrifugal pump shuts off, the column of water has a certain momentum which continues until it has spent itself in overcoming friction and gravity, after which a reversal of flow takes place. A check valve to operate without noise must close at the very moment the reversal of flow starts. It is the sudden stoppage of the reversal of flow that causes the water hammer. Since water is incompressible, it can be compared to a solid column, and its action on the disc of the check valve is the same as dropping the weight in a pile driver.

Prevention is the by-word in every industry. It is better engineering to select the proper type of outflow or check valves, so that the water hammer will not take place, than it is to allow water hammer to take place and then try to control it.



The asphalt concrete for the street construction program at Oak Ridge was mixed at this plant.

How Oak Ridge Street Program Grew

A network of streets for what maybe the world's most important city

OAK RIDGE is a name to conjure with these days. Originally it was nothing more than an area, a location in Tennessee. To the north was Poplar Creek, west of the community of Wheat. To the south was what the people called Black Oak Ridge. When leading scientists of the democratic world pooled their knowledge to produce nuclear fission that led to the spectacular atom bomb, our government set aside this wooded area for their workshop. And they gave it the disarming name of Oak Ridge for the distinct purpose of keeping its important identity secure.

But for all its important mission, not only to protect the democratic way of life but to unfold new and richer possibilities for our peaceful life, a community of some sort had to be formed, and, even more prosaically, streets had to be built. Because these streets had some points of interest, because they offered the designer the opportunity to do what he wished in order to make these streets function most effectively, this article will dwell on one of the most commonplace functions in the world's most dynamic city.

As observed previously, the Ridge is heavily wooded. This permitted the city planners, Skidmore, Owings and Merrill, to lay out a picturesque community

This rubber-tired Caterpillar tractor handily carves out the street gutter line.

An Allis-Chalmers tractor pulls a power blower that cleans the pavement surface.

among the hardwoods and the conifers.

Planners place the city streets and engineers must then build them. When these streets wind and twist among the hills and valleys, the engineers must use great ingenuity to establish favorable grades and locate convenient building sites.

In this case, however, the planning made possible economical street construction. They were laid out to follow the contours, a procedure which minimized grade operations and cost, and expedited completion of streets for the fast-growing town.

This planning also did something else. By allowing the streets to follow their natural paths around the hills, the planners automatically eliminated most of the conventional right-angle intersections. There are some, however. The principal north-south thoroughfares lead up-grade from the three parallel arterial streets, along the crests of rolling hills or spurs, and connect with second arterial streets extending along the ridge top.

The main thoroughfare looks like this today. The median strip makes the direction of traffic easy.

Street Nomenclature

It is one thing to have winding streets picturesquely located. It is another to have a street system function, so that if a person is given a house number and a street name, he can go there without getting lost. The planners took the confusion out of the street locations by a clever bit of naming. They designated those principal north-south thoroughfares and the three principal east and west streets as avenues. The connecting roadways they called "Roads"; loops returning to the same road at a different point, they designated as "Circles"; and dead end streets were identified as "Lanes" or "Places."

The street naming is simple and efficient. The alphabetical system prevails for all but the three east-west arterials. Here is an example: All streets leading from Kentucky Avenue have names beginning with the letter "K," as for example: Kelvin Lane, Kenwyn Road, Kimball Lane, Kingsley Road, Kingfisher and Keystone then intersect from a a point where Kingsley and Kenwyn meet head on. Similarly the names of circles, roads, and lanes progress alphabetically from north to south or east to west with the same first letter as the parent street.

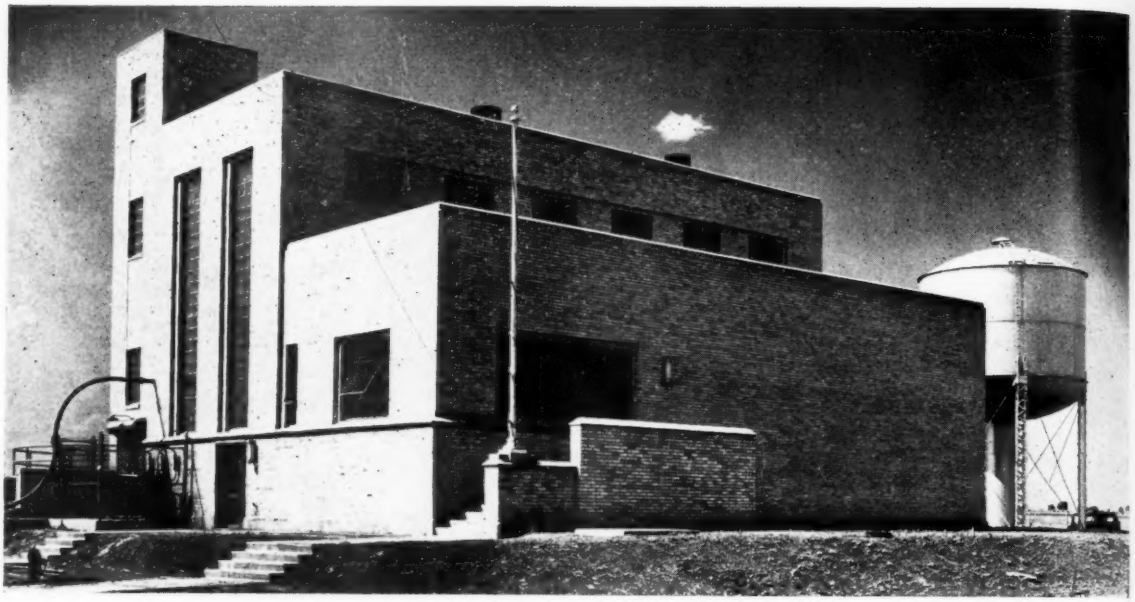
When it had been determined that the city would continue as a permanent installation, there was need for a permanent pavement with curb-and-gutter sections and adequate draining facilities. This was designed to utilize to the fullest extent the existing pavement consisting of crushed-stone base with a light bituminous surface course. On the main thoroughfares four-lane pavements were constructed with transition lanes located at bus stops, allowing passengers to be discharged or taken on by buses or other vehicles, thus permitting vehicles to be completely outside main traffic lines. A new surfacing was required that would be the quickest to place, because traffic had to be accommodated continuously. A hot asphaltic concrete surface course was selected as best suited for this and all other uses.

The completed pavements were properly marked for pedestrian cross-overs and traffic, with center-strip paint containing reflector beads for reflecting properties at night as well as day.

The entire business section and heavily traveled thoroughfare are equipped with properly synchronized electric traffic signals.

A Buffalo-Springfield roller puts the finishing touches to the bituminous mat surfacing the street.

A Barber-Greene paving machine dispenses the asphalt surfacing and lays it to a firm, true grade.



Marshall's new softening plant.

An Eight-Mile Search for Water

Marshall, Mo., population 8,000, ends a 40-year water famine by developing a new well field and building a modern treatment plant

By L. E. STARK
Superintendent, Water and Electric Utilities
Marshall, Mo.

AS EVERY water-works man knows, dependability is a factor that his water users take for granted. Most people know what they want to come out of the household faucets. They want a product that is pure without an offensive taste, colorless, and reasonably soft; above all they want it to be available whenever they turn the handle of the faucet. But few of them realize the trouble that they can present to the water-works man with these specifications.

Since the public demands it, the water-works man must provide a supply to meet it, even though it means a project of major proportions. It did in Marshall. It took a geological study that ranged to a well field eight miles away. It required an engineering analysis that resulted in a water-softening plant with treatment that made the water non-corrosive. And it produced a yield that made the water adequate to meet our needs for many years to come.

Good Water Scarce

Marshall is located in an area where good water is scarce. For a half century the people have known this. The realization of this scarcity prompted them to purchase their water system in 1901, and thereby assume responsibility for its development

At that period, the city drew water from a set of wells located on the east city limits. The operation of these wells set a pattern for the balance of the wells nearby. They produced adequately for a few years, gradually decreasing in yield until, in 1916, officials had to look elsewhere for water. The well depths had to be limited to 130 feet, because below this the area is underlaid with a heavy concentration of chlorides.

A Search for Water

After 1916, the city began its wandering search for more adequate locations. The water department acquired land in different spots to the west and drilled wells in 1919, 1920, 1928, 1936, 1940, and 1944. We have had to abandon completely all wells except those acquired in 1936, 1940, and 1944 because of lack of static water head to support a well. Actual field tests indicated the static water level to be lowered as the well was pumped out. We found that when a new well was drilled, the depth of water ranged from 30 to 35 feet. After a few years of pumping, this head would only be 10 to 12 feet. Wells unsuited for pumping were becoming more frequent. Until recently, pumps delivering 150 gallons per minute could be used on certain wells. At present, the maximum pumping rate of the 13 wells available today is approximately 600 gallons per minute. If they are pumped faster than this, they will break suction and pump air.

For nearly 20 years the people of Marshall have known that they were going to have to look elsewhere for an adequate water supply. In 1928, the Board of Public Works retained Henrici Lowery, consulting engineer, who advised them that another source of supply was inevitable if the production was to keep abreast of water use. Since then it has been a constant battle to keep the mains wet. In the early days the average pumpage was less than 100,000 gallons per day. Today the peak is approximately ten times as great. The average use of water, incidentally, is 60 gallons per capita or slightly over half that in most cities.

Furthermore, this small quantity of water has been of poor quality. It has been uncomfortably hard, ranging from 325 to 350 ppm calcium carbonate, about one part per million of iron, and with chloride running around 25 to 30 ppm, although they have run as high as 400 ppm. The excess chlorides caused an unpleasant taste, and the lack of water put the town in constant danger in the event of fire. The iron stained clothes and caused trouble in the plumbing fixtures.

Treatment Failed

In 1927 the Board removed the excess iron with an aeration treatment through a set of spray nozzles. In 1932 it went further and installed a zeolite softener at the treating plant. The design of the softeners was on the basis of 450,000 gallons per day, reducing water with 200 ppm total hardness to zero. This amount of softened water was then proportioned back with raw water to yield a finished water with roughly 80 ppm. This gave fair results for a time, though the capacity was somewhat reduced by treating water harder than 200 ppm. Then, as the quantity of well water dropped, the plant no longer had the capacity to furnish water to backwash the filters. The softener had to be abandoned.

Such experience with the water supply culminated in the Board's retaining Black and Veatch to recommend an answer. This firm took cognizance of the inadequacies of local groundwater supplies previously listed and the difficulties involved in developing a surface supply, together with our people's preference for well water. With the State Geological Survey, their engineers located a field of groundwater of more favorable characteristics some eight miles northwest of the city.

Their population studies indicated that Marshall might be expected to grow to 15,000 in 1980, and that very likely the water use would grow to 125 gallons per capita instead of its present 60 gallons. With these thoughts in mind, they concentrated on a supply able to provide 4 mgd.

New Plans Drawn

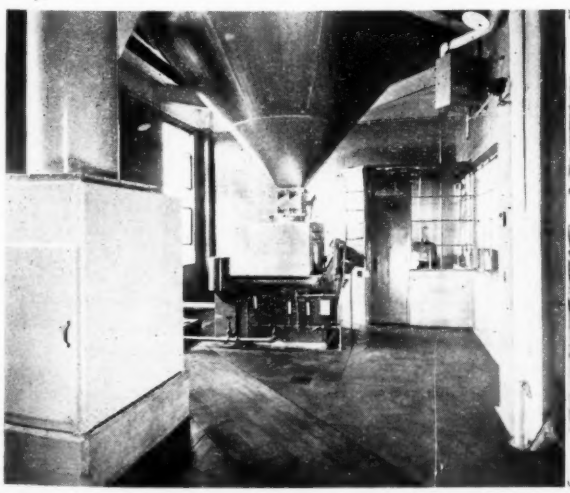
Early in 1945, plans and specifications were begun on the treatment plant and supply line. In order to provide a firm capacity of 1.5 mgd with one well out of service, three 750,000-gallons-per-day Layne Western gravel-wall wells were drilled. Each was provided with a turbine-type motor-driven deep-well pump. To connect this well field with the present system is a 12-inch cast-iron pipeline. In order to meet present water shortages, two of these wells were immediately placed in service, using a gasoline engine with a right-angle gear head and shaft.

Water from the new wells contained a hardness of 225 ppm and an iron content of 0.3 to 3.0 ppm. Free carbon dioxide up to 8.0 ppm is recorded, with a pH test showing 7.6. On this basis it is reasonable to expect that the water would be somewhat corrosive, and that consequently it would be a good plan to locate a treatment plant at the site of the wells in order to protect the pipeline from excessive tuberculations and the growth of iron organisms. There also is a railroad line available for the delivery of chemicals and disposal of sludge is not so great a problem as it is in the city. The new treatment plant treats the water by indoor aeration, lime and soda-ash coagulation, recarbonation, and filtration. The aerator is of the conventional coke-tray type with a perforated stainless steel distributing tray. A vertical forced-draft tube is connected to a 2,000-cfm exhaust blower; air is drawn through the falling water and discharged outside. Some iron is released here with the reduction of the dissolved carbon dioxide.

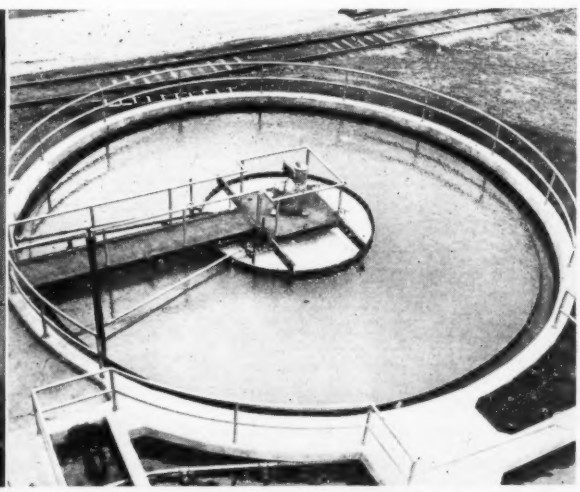
From the aerator the water enters an Infilco Accelator 40 feet in diameter and 18 feet deep. The basin size selected was based on a rise rate through the sludge blanket of 1.5 gpm per square foot and a total capacity of 2 mgd. Following this slurry type of softener, there is a recarbonation chamber where carbon dioxide from an oil burner will be added. This chamber has a theoretical retention capacity of 10 minutes.

From the recarbonation basin the water enters the final coagulation basin, where alum may be added. The basin provides one-hour retention based on 2.0 mgd rate. Before leaving this basin, the water passes over a second carbon-dioxide grid which changes any remaining carbonates to bicarbonates. After passing the final coagulation basin, the water will flow onto the filters. Two filters are provided with a capacity of 1 mgd each, based on a 2-gpm-per-square-foot rate. The underdrains are of the Leopold block type. A set of Ludlow hydraulic valves operated by Bacharach filter controls governs the filter operation.

Wash-water facilities consist of one 300-gpm Fairbanks-Morse horizontal split-case pump directly connected with a 7½-hp 440-volt electric motor discharging to a 50,000-gallon Chicago Bridge and Iron elevated wash-water



View of the chemical-handling room. Pneumatic line-handling equipment is at left. At right is alum feeder.



Softening action takes place in this upflow clarifier that operates on the suspended sludge-blanket principle.

storage tank. Pumping facilities for delivering the water through the pipeline to town consist of two 1,050-gpm Fairbanks-Morse electric high-service pumps. Duplication of these two units is required in order to provide a firm capacity of 1.5 mgd. These pumps take suction from a sump located immediately below the final filters, pumping directly into the 12-inch flow line to the clear wells at the city end.

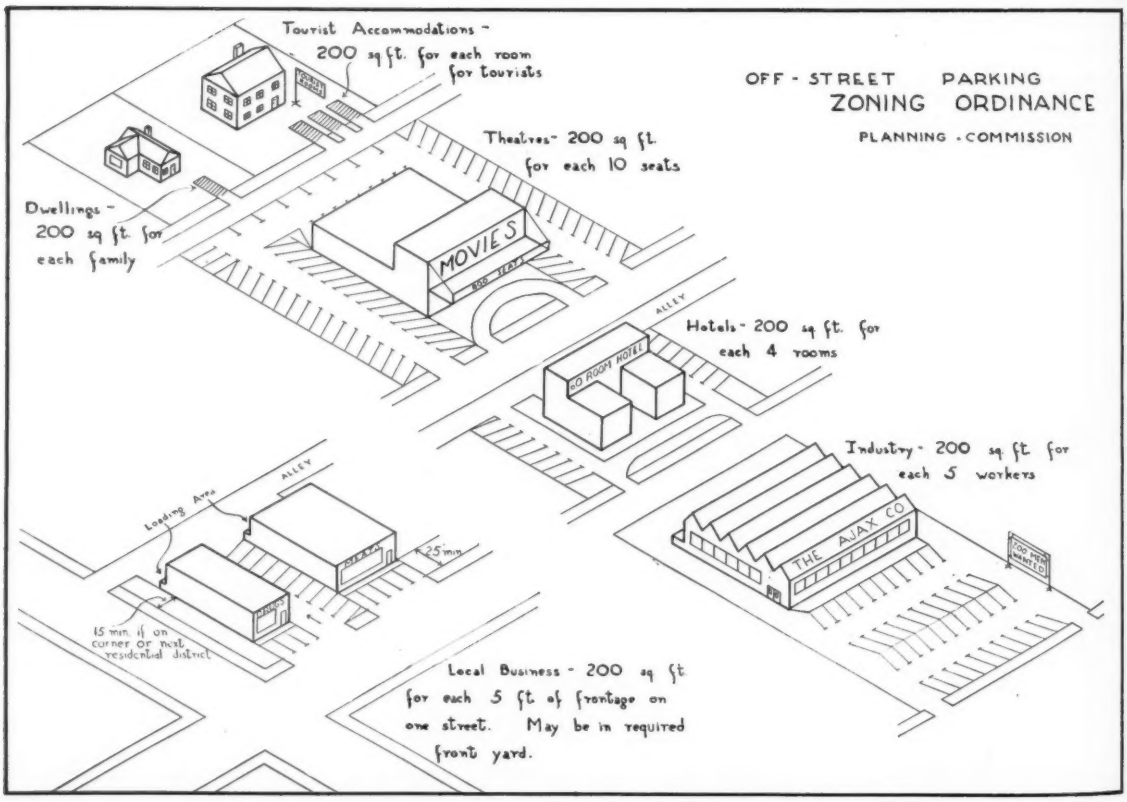
Chlorine is added to the clear well and again at the storage reservoir in the city. At the plant, prechlorination may also be used. The plant has a Leeds & Northrup pH indicator-recorder with sampling points throughout the process. A plant-control valve to balance low-service in-pumpage against high-service pump output is provided. Sludge is disposed of by ponding with the wash water in adjacent acreage; it can also be dried on sand beds.

In order to provide for the use of bulk lime and one-man operation, the designers arranged for Dracco pneumatic lime handling equipment. Lime will be transferred from railroad cars adjacent to the plant to a 60-ton steel storage tank located immediately above the lime slaker and feeder. This equipment will have a capacity of five tons per hour and is of the "push-pull" type. Alum and soda-ash are received in sacks and unloaded from cars and trucks onto a dock adjacent to the building. An elevator of 2,000-pound capacity opening onto the dock will be used to transport the sack materials to the chemical storage room on the upper floor.

Construction has proceeded satisfactorily. The contract for the 8 miles of 12-inch line was awarded in June of 1945, and was completed on April 10, 1946. The treatment plant contract was awarded in November 1945. The work began on March 8, 1946, and was completed on September 8, 1947. The wells were all drilled and completed in June 1945. The total cost of the project has been $620,000, of which $450,000 was provided from general obligation bonds; the remainder was furnished from accumulated earnings of the water utility.

For the first time in the history of Marshall, the people have available to them a plentiful supply of good, potable water. At the same time they have greater protection against fire and a supply of water that meets taste, odor, and softness requirements. The user accordingly has a greater confidence in what he will receive when he turns the handle of the faucet, and the officials of the Water and Electric Utilities can sleep without dreaming of where to drill new wells.

Zoning for Off-Street Parking


Tourist Accommodations - 200 sq ft. for each room for tourists
OFF - STREET PARKING ZONING ORDINANCE
PLANNING - COMMISSION
Theatres - 200 sq ft. for each 10 seats
Dwellings - 200 sq ft. for each family
MOVIES
ALLEY
Hotels - 200 sq ft. for each 4 rooms
50 ROOM HOTEL
Industry - 200 sq ft. for each 5 workers
THE AJAX CO
Loading Area
ALLEY
25' min.
15 min. if on corner or next residential district
Local Business - 200 sq ft for each 5 ft of frontage on one street. May be in required front yard.

This sketch, reproduced from *The Tennessee Planner*, a periodical of the State Planning Commission, visualizes some of the off-street parking provisions required in the Zoning Ordinance of Athens, Tenn. The sketch does not represent any existing area, but simply shows the amount of space that different types of establishments must provide. An ordinance of this type will go a long way toward minimizing congestion on the streets as a community grows.

What Westchester County did to fit a government-built airfield to civilian use

Civilian Hangar for Military Airport

LIONEL FREEDMAN: PICTORIAL SERVICES

This hangar is the nerve center of the Westchester County airport.

HOW to "rehabilitate and readjust" an airport was the problem that faced Westchester County, N. Y., at the conclusion of World War II. The problem arose when the county came into possession of the government-built airfield located five miles northeast of White Plains. With it came the added problem of utilizing its three modern runways and adjacent taxiways make a functional airport that would be of maximum use to the community. The runways and taxiways, capable of handling the largest and most recently developed aircraft, represented the total facilities on the field.

James C. Harding, County Commissioner of Public Works, fully appreciating the potential value of a modern airport to the community, set about the task. The county authorities decided that such development could best be accomplished by private enterprise, and accordingly leased the property to the County Airport Corporation. The Department of Public Works and County Airport Corporation representatives consulted the Luria Engineering Corporation, of New York City. After a careful analysis of their requirements, a mutual agreement was reached on the preliminary design of a hangar capable of accommodating private and commercial planes up to the size of the DC-4, as well as providing ample office and shop space. The "Luria Standard Hangar" was found to be readily adapted to meet all their basic requirements efficiently and economically.

Uses Rigid Frame Design

In final design, the rigid-frame Luria Hangar provides 16,800 square feet of open hangar space readily accessible through horizontally sliding doors 120 feet by 20 feet. Two 2-story lean-to's of standard design, each 20 feet wide, flank the full 140-foot depth of the basic hangar and provide space for the multitude of operational facilities necessary to the function of a modern airport. A special control tower was designed by Luria as an integral part of the building; it rises gracefully from the lean-to, maintaining pleasing architectural conformity, enhanced by brick facing of all walls. The tower is air-conditioned with acoustic-type ceiling and affords unrestricted vision through windows of heat-absorbing glass. The base of the tower contains a complete installation of the most advanced communications equipment, including an instrument-landing system.

Today the Westchester Airport is in full operation. Plane movements run almost 25,000 a month. The field is used by major airlines for scheduled flights, private plane owners, firms engaged in instructional charter and non-scheduled air carrier activities, and by other major airlines as a standby terminal for New York ports.

The Luria structure affords complete operational, administrative, and maintenance facilities for the field—comfortable waiting rooms, lunch counters, an attractively furnished restaurant, locker rooms, stockrooms, and engine, fabric, and paint shops. It is the nerve center from which all operational controls radiate, and the focal point for all commercial, social, and recreational functions. It provides the utmost of service and comfort to those using the port and will provide proper accommodations for whatever additional activities may be desired.

A Few Elements in Check-Valve Operation

TESTS indicate that water hammer is caused by sudden stopping of a column of water. Its intensity is governed by the velocity of water travel and the speed of valve-closing. The energy exerted by stopping the flow is taken up in the piping and the equipment. If great enough, the actionn causes damage and, very likely, disagreeable odors.

Water hammer creates a pressure of 54 pounds per square inch for each foot-per-second of velocity that is stopped by the valve. Thus with the instantaneous closure of a valve carrying water traveling at 10 feet per second, a pressure of 540 pounds per square inch would be created. Where dead ends exist, as is the case with check valves, this pressure may increase tremendously.

In general, air chambers used in connection with water hammer caused by check valves have not been satisfactory.

Water-hammer action can be minimized by quick-acting check valves. After driving force ceases, when the motor driving a centrifugal pump shuts off, the column of water has a certain momentum which continues until it has spent itself in overcoming friction and gravity, after which a reversal of flow takes place. A check valve to operate without noise must close at the very moment the reversal of flow starts. It is the sudden stoppage of the reversal of flow that causes the water hammer. Since water is incompressible, it can be compared to a solid column, and its action on the disc of the check valve is the same as dropping the weight in a pile driver.

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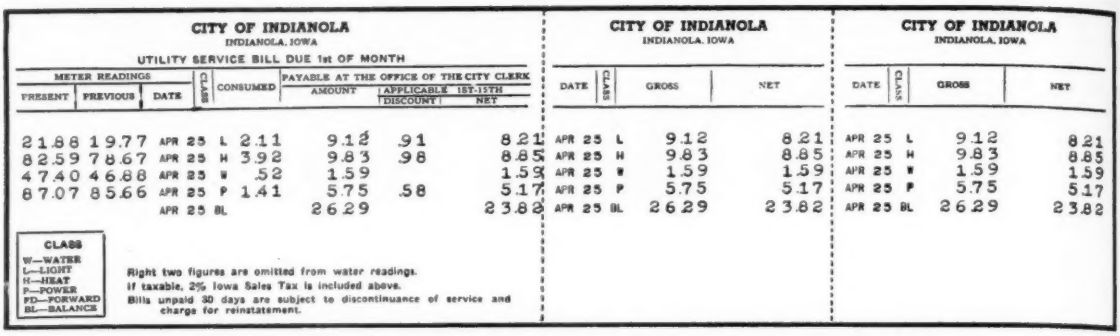

CITY OF INDIANOLA
INDIANOLA, IOWA
UTILITY SERVICE BILL DUE 1st OF MONTH

METER READINGS PRESENT	METER READINGS PREVIOUS	DATE	CLASS	CONSUMED	PAYABLE AT THE OFFICE OF THE CITY CLERK AMOUNT	APPLICABLE 1ST-15TH DISCOUNT	NET
21.88	19.77	APR 25	L	2.11	9.12	.91	8.21
82.59	78.67	APR 25	H	3.92	9.83	.98	8.85
47.40	46.88	APR 25	W	.52	1.59		1.59
87.07	85.66	APR 25	P	1.41	5.75	.58	5.17
		APR 25	BL		26.29		23.82

CLASS
W—WATER
L—LIGHT
H—HEAT
P—POWER
FD—FORWARD
BL—BALANCE

Right two figures are omitted from water readings.
If taxable, 2% Iowa Sales Tax is included above.
Bills unpaid 30 days are subject to discontinuance of service and charge for reinstatement.

CITY OF INDIANOLA
INDIANOLA, IOWA

DATE	CLASS	GROSS	NET
APR 25	L	9.12	8.21
APR 25	H	9.83	8.85
APR 25	W	1.59	1.59
APR 25	P	5.75	5.17
APR 25	BL	26.29	23.82

CITY OF INDIANOLA
INDIANOLA, IOWA

DATE	CLASS	GROSS	NET
APR 25	L	9.12	8.21
APR 25	H	9.83	8.85
APR 25	W	1.59	1.59
APR 25	P	5.75	5.17
APR 25	BL	26.29	23.82

This penny-postal-card bill includes both the water and the electric bill.

Post-Card Billing Suits Utilities In Indianola

By CARL BROWN
City Clerk
Indianola, Iowa

PRIOR to 1941, we computed all customers' bills for electricity and water, then printed our figures on separate customer ledger sheets for each class of service. From the ledger sheets we made up the bills with an electric billing machine and added our computations to obtain total consumption and amounts.

In 1941, we bought an electric combined posting and billing machine which would give us total consumption and in this way reduced the number of operations. We made separate bills for each class of service. These were assembled and mailed to each customer in envelopes.

When postage rates were raised our method was rendered obsolete. We changed to a penny-postal-card billing system and combined all charges on this one card. The new Underwood Sundstrand equipment also included some other labor-saving features, and we are now able to furnish our customers with the totals of all consumers' consumption by classes of service.

Our first use of this present equipment was for the October 1945 billing. The bill is set up on the ledger and repeated on the precanceled postal card which is put into the machine at the same time as the ledger sheet. The gross and net charges are again repeated on two stubs attached to the postal card. We tear the postal card from the stubs and mail it to the customer. The two stubs are filed. If the customer fails to bring his bill with him when he comes in to pay, one stub serves as his receipt and the other for our record. The same machine posts the credits from our stubs.

The ledger-sheet value is that it gives us a two years' record of each customer's meter readings, consumption, charges, and credits. It is a valuable reference in cases of customer complaints.

Accompanying the October 1945 bill was a printed letter to customers which read:

The electric and water utilities in your city are owned and operated by the city through the council which the citizens elect. You, as a stockholder, are interested in the dividends.

LOW RATES: Your rates are among the cheapest in the state for similar service under similar conditions. Your electricity is dependable. Your water is softened for you and is free from objectionable chemicals to make it pure. The cost of your electricity has not increased with the other costs of living.

FREE SERVICES: Although your rates are among the lowest, you also have free street lighting, free light and water at your public library, free water for the operation of your sewage system, for your fire protection, for street flushing, and other free public services. Many cities with similar and higher rates pay for such services from tax levies.

Since that first modern billing, we have combined a sewer rental with our water charge. Our power plant addition, costing $100,000, has been in operation for a year. A flood last spring has caused us to chlorinate our water as a precautionary measure.

Where Will Water-Works Construction Costs Land?

ANY immediate new construction in the water-works field should be based on an over-all price level of at least 65 to 75% above pre-war construction. Future construction should be based on a price level ranging between 55 and 60% over the pre-war level. Thus asserted Francis Friel of Albright and Friel, consulting engineers of Philadelphia, Pa. He gave this opinion in an address delivered before the recent annual conference of the Four States Section of the AWWA in Washington, D. C.

Mr. Friel reported that the cost of a 6-inch pipeline, prior to the first World War, was a little more than $1.00 per foot. In 1940 this same size of line could be installed at a cost averaging $2.00. Today the cost of installing a 6-inch main will average $3.50. These costs do not include fittings in fire hydrants.

In addition, many filter plants were constructed before World War II at a unit cost ranging from $40.000 to $60,000 per million gallons of plant capacity. In recent construction of typical plants, Mr. Friel has found that the costs run to $86,000. Adding to this a 15% contingency figure, normal for present-day construction, the price would rise to $98,000. Based on this and other experiences, he feels that engineers should now think of water filtration plants costing $100,000 per million gallons of plant capacity.

Elevated tank costs have similarly risen. During the depression days the tanks could have been erected for as little as $20,000. Today an elevated tank with a capacity of 250,000 gallons will cost approximately $50,000. In 1940 a similar tank would have cost $25,000 to $30,000. All tank costs have increased from 80 to 100 per cent.

He emphasized water demand has not dropped off. Published records by the American Water Works Company covering 70 subsidiary companies in 19 eastern states show that residential customers from 1940 to 1946 had increased 12.4% in number and 26.2 in water use. Commercial customers increased 8.9% in number and 35.4% in water use. dustrial users require 41% more water.

XUM

Tomorrow's Challenge To Civic Leaders Today

By MARTIN WRIGHT
Employe, Community and Public Relations
New Haven, Conn.

WHILE the world watches politics and economics mesh together in the Marshall plan for European recovery, city officials may well go back to the books for an economic refresher for themselves.

For soon they'll be looking for the answers—and what to do with them—to such questions as these:

What will happen to your city if American exports, which have been running at a rate close to 20 billion dollars a year, drop off 5 billion dollars? How much employment in your city depends on high exports?

If the current boom runs out and a recession occurs, say a 20% drop in the Federal Reserve Index of Production, is there enough of a backlog of federal, state, and city projects in your area to absorb the industrial workers who will be laid off?

Would a drop in economic activity in your area force your city to increase tax rates—and so discourage industry even more?

Have your city, its business community, and its people enough in reserve—in savings—so that there is a "cushion" afainst a mid recession?

These are home-grown varieties of economic-political questions which civic leaders should be pondering now—well before the boom runs out.

Build Recession Roadblocks

With intelligent forecasting of what might happen if and when the boom turns, your city and its industrial leaders can build road-blocks before a recession. At least you can help prevent its triggering off a real local depression.

The picture will be different from that of 1930, of course. Unemployment compensation, alone, will slow down the chain reaction of a depression to some extent. Purchasing power will not be cut quite so drastically when industrial payrolls drop. There will be a "floor" of compensation allowing unemployed workers to continue to buy the minimum amount of food, clothing, and shelter.

Just what will happen to your city can be forecast only through a study of your local economics: the types of industries, their markets, the resources of the people and businesses in the area, the "backlog" of governmental and industrial projects which will be pushed through if prices fall and more labor becomes available, and the possibilities of industrial expansion, new businesses and services, or other activity that will absorb surplus manpower.

Your city's own financial picture will be important, too. Is your local economic "climate" good enough to encourage new industries, to encourage the expansion of old companies, to encourage home building?

Are your city's tax structures and credit good enough to push through the buildings, new roads and streets, and other improvements which are probably needed, in "bad times"? Inflation, in which higher prices are accompanied by increased economic activity and full employment, both hurts and helps city financing. More taxes are being collected, even though rates may have advanced only moderately. But prices and wages are higher, and evidently will be high for a long time to come. What will happen to your city's operating budget as well as its capital investment program if revenues fall? And, if relief and welfare loads increase at the same time revenues fall, will the city still be in healthy financial condition?

Before you can get the answers to questions on your city's economic condition and what it will do when troubled times come, you must first of all know what question you want answered.

Getting the Facts

And that depends on what your city's or town's economy is constructed. Probably your chief concern will be to know what you can expect in industrial employment, how a drop in industrial employment will affect employment in your city's stores and service industries, and what the city can do about it.

In a small town, conferences with industrial leaders should produce a forecast of local employment and what will happen to it as the national economy goes up or down.

Records of representative retail and distributing firms, local utilities, railroads, and other service industries will show how their employment fluctuates in relation to employment in the basic local industries.

A survey of your city's own building program, state and federal construction projected for your area, and the estimates of private construction firms as to the amount of private construction they foresee at varying price levels will give you an estimate of the jobs which will be available in the construction industries in the next two years.

Some cities will have to consider farm income and its effect on local employment, the amount of shipping being handled in the area, or, perhaps the welfare of foreign markets for their goods and services.

You shouldn't need an economist to compile the data and make a forecast. There may be someone in the municipal government, the planning commission, one of the banks or businesses, or in a local university who can do the job.

Use the Forecasts to Advantage

The forecasts should enable city governments to plan construction programs, for instance, so they'll give the city's economy a shot in the arm instead of burdening it. In cities which now enjoy "full employment" with all available construction labor working on private construction, starting road-building programs now merely adds to the inflation of building costs by competing for labor and materials. But, by postponing construction until materials and labor are available, the city will get better value for tax dollars and also give its own economy a lift when it needs it.

City officials and industry and business leaders by cooperating now can reinforce their city's economic strength.

This same kind of cooperation in attacking traffic problems, studying taxation and its effects, rebuilding industrial areas, and encouraging housing can put the city a long step ahead in the job it does in providing service for its citizens—and can put a good-sized cushion under its economy, too.

But to do it—and the time is now—requires a better understanding, more cooperation between your community's public officials and its industrial and business leaders. It's time to get together and tell the people in your town what you are doing and why you are doing it. In that way, you will be winning the good will and support of your local government, strengthening local industry, and building a sound foundation for our private enterprise system in the years ahead when it will be receiving its most severe tests.

Some Fundamentals in Water Revenues

WATER supply, when operated municipally, is a combination of *proprietary* and *police* functions. As a service that supplies water for domestic and industrial use, it is *proprietary* in character. It is like any other business conducted for profit, except that it is municipally owned and monopolistic in character. And these "profits" in so-called good-years should properly be earmarked for immediate plant expansion or set aside for plant expansion and rehabilitation in the future.

Except for those using the flat-rate system, the charges made for the service depend substantially on the amount of water used. They do not depend on the valuation placed on the home or business served. The water utility charges at the same rate whether it serves the small cottage by the railroad tracks or the mansion on the hill.

Fire Protection Charges

The water service *police* function lies in the fire-protection aspect. Police functions basically include those activities that protect life and property. Charges for these services should come from the general tax funds, and should be proportioned primarily on the property valuation basis. Fire and police protection are examples. Thus the mansion on the hill, well-built and well-nigh fire resistant, may never have occasion to call the fire department, while the small frame dwelling across the railroad tracks may be poorly constructed and a constant fire risk. Yet the money paid in the form of taxes for fire protection will be far greater for the former than the latter, despite its lack of need for service.

As is well known, the water department plays an indispensable part in this firefighting work. Were the water system to be built for domestic and industrial service only, the mains could be much smaller and the construction much simpler, since for fire-protection purposes a community must have fire hydrants, larger mains, and more water held in reserve. A water utility is called upon to assume additional expenses that properly should not be charged against the water user for domestic or industrial purposes alone.

When and if this occurs, the customary means of raising such revenue is through fire-service charges. In the past many cities have paid this to their water utilities in the form of a flat rate based on the number of fire hydrants. Frequently the water utility and the city officials have agreed between themselves on a fair charge, and have simply divided it by the number of fire hydrants to obtain a unit charge. Then, as extensions in the system become necessary, new charges are made on the basis of the hydrants installed.

In recent years, there has been a distinct trend toward basing the charge not on the number of hydrants alone but also on the increased size of pipe required. Thus the increased diameter in inches matched against the number of feet of mains installed gives a fair and consistent method of making these charges, regardless of inconsistencies in hydrant installation. Fred R. Witherspoon, Senior Engineer of the Indiana Public Service Commission in Indianapolis, gave a workmanlike summary of this practice at the Indiana Section of the American Water Works Association last year. (See p. 95, THE AMERICAN CITY, August 1947.)

Mr. Witherspoon outlined two common methods of estimating the portion of the water works' total expense chargeable for fire protection. To meet this expense, he recommended making an annual charge of $10 to $15 per hydrant, and apportioning the rest over the distribution main of 6 inches and larger in the case of large systems, and 4 inches for smaller systems.

Paradoxically, one of the "advantages" of municipally owned water plants is reported to be the elimination of the hydrant rental usually charged by privately owned utilities. The costs covered by this charge are real. The "savings" naturally are merely a bookkeeping manipulation.

Business Aspects of Water Works

A water works, when municipally owned, is a unique business in that the people of the community are in effect stockholders. Yet in the great majority of cases today, when revenue bonds are used for financing, the residents as individuals do not assume financial support of the system. When a water department today embarks on a construction program of any size, it borrows money by means of revenue bonds, pledging its own earning power rather than the integrity of the city itself to guarantee repayment. Therefore, though the people in a city own the plant, they themselves are not financially liable for its management.

This is not true everywhere. In New Jersey, for example, water bonds pledge first the receipts of the department and then the credit of the city.

As a business, it should meet its operating expenses, any bonded indebtedness, and have some sort of arrangement for depreciation. One may correctly question the advisability of considering as *capital* the interest, retirement and sinking fund accumulations, and at the same time set up a depreciation fund to replace items paid for by bonds. But at least depreciation should be recognized.

As a municipally owned venture, it may or may not be obligated to pay taxes. But in recognition of civic responsibility, it should make a payment to the city's general fund in lieu of taxes. Thus, it would put itself on the same basis as a privately owned utility offering the same service.

Certain water departments in essence do this in an indirect manner. They furnish water to the city for municipal uses at no charge. They make no charge for fire protection. And to balance this, they make no contribution to the tax fund of the city. It may be that these free services balance the contribution to the tax fund, but no one is ever certain of this figure until it has been presented in an orderly manner. Certainly such a practice can scarcely be called good business.

Summary

Consequently, when analyzing the fundamentals of fund raising for a water utility, we see these principal factors:

1. The water utility, when municipally owned, combines the proprietary features of a business with the police features of a service that is designed to protect public safety, health, and property. Proprietary services are paid for on the basis of service rendered, whereas police functions are financed out of general tax funds.

2. Obviously, it is fair for the water user to pay for that portion of the water used solely for the community protection by firefighting. The most equitable method of calculating this fire-protection portion of the water service appears to be on an inch-foot basis of the water main, combined with an annual hydrant charge.

3. Although the water service, in the great majority of cases, is a municipally owned venture, it has in recent years been obliged to finance improvements by pledges against it as a going business without the integrity of the com-

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munity to back the borrowing. Thus, while the service is owned by the municipality, the municipality does not assume financial responsibility for it.

4. As a point of good business responsibility, the water utility should make a payment in lieu of taxes, which would correspond to the amount that normally would be paid by a privately owned utility, and should do this directly rather than through the medium of "free" services.

Acknowledgment

Although the material in this article does not necessarily reflect the opinions of the men mentioned below, the writer gratefully acknowledges the assistance and counsel of the following:

Wendell R. LaDue, Superintendent and Chief Engineer, Bureau of Water and Sewerage, Akron, Ohio. Past president, American Water Works Association.

Charles H. Capen, Chief Engineer, North Jersey District Water Supply Commission, Wanaque, N. J.

Samuel A. Greeley, Greeley and Hansen, Engineers, Chicago, Ill.

Lincoln, Nebr.

Rates Per Month

Residential

First 5,000 gals.	14c	per 1,000
Next 5,000 "	12c	" "
Next 5,000 "	10c	" "
All additional	8c	" "

Non-Residential

First 50,000 gals.	14c	" "
Next 350,000 "	12c	" "
Next 2,600,000 "	10c	" "
All additional	8c	" "
Sprinking or air conditioning through separate meters	10c	" "

Minimum Charges

⅝ or ¾ or 1" meter	$0.50
1½ inch meter	1.50
2 " "	2.50
3 " "	5.00
4 " "	10.00
6 " "	20.00

General Data

Population served (est.)	95,000
Services (99% metered)	23,179
Hydrants	2,125
Valves	2,243
Miles of mains	265
Storage, ground	26.5 mg
Storage, elevated	0.25 mg
Supply—wells	
Treatment—aeration, chlorination, sedimentation, filtration	
Average demand	12.4 mg
Plant capacity	50 mg

Water Characteristics

$CaCO_3$	61 ppm		
Fe	..		
Mn	8.0		
pH	7.3		
Temperature	56°—59° F		

Customer Costs

3,000 gals. (400 cu. ft.)	$0.50
5,000 " (667 cu. ft.)	0.70
10,000 " (1,333 cu. ft.)	1.30

Duluth, Minn.

Rates Per Month

First 10,000 cu. ft.	15c	per 100 cu. ft.
Next 10,000 cu. ft.	12c	" " " "
All over	8c	" " " "

Minimum bill is 50c for ⅝" meter.

Water used for elevators, motors, swimming pools, refrigeration, and air conditioning:

First 1,000 cu. ft.	15c	per 100 cu. ft.
Next 1,000 cu. ft.	12c	" " " "
All over	8c	" " " "

Minimum bill 50c per month

Other miscellaneous charges include:

Water for private skating rink	10c	per 100 cu. ft.
Water for public skating rink	8c	" " " "
Water used for lawn sprinkling (used between 6 p.m. and 5 a.m.)	6c	" " " "
Public fire hydrants	$50.00	per year

General Data

Population served (1940 census)	101,500
Services (82½% metered) (as of Dec. 31, 1947)	24,724
Hydrants	1,364
Valves	2,866
Miles of mains	271
Storage, elevated	40 mg
Service levels	3
Supply—Lake Superior	
Treatment—breakpoint chlorination	
Average demand	12 mg
Plant capacity	20 mg

Water Characteristics

Ca	17.3 ppm	pH	7.6
Fe	0.10 ppm	Temperature	40° F

Customer Costs

3,000 gals. (400 cu. ft.)	$0.60
5,000 " (667 cu. ft.)	1.00
10,000 " (1,333 cu. ft.)	2.00

Waukesha, Wis.

Rates Per Month

First 3,000 gals.	20c	per 1,000 gals
Next 13,000 "	15c	" "
" 84,000 "	12c	" "
" 116,000 "	10c	" "
" 284,000 "	8c	" "
" 1,500,000 "	7c	" "
All over	6½c	" "

Minimum Bill

⅝" meter	$0.60		
1" "	1.00	3" meter	6.00
1½" "	1.66	4" "	12.00
2" "	3.00	6" "	25.00

A 10% penalty is attached to the water bills if not paid by the 15th of the month.

General Data

Population served	24,200
Services (100% metered)	4,530
Hydrants	447
Valves (approx.)	1,000
Miles of mains	55
Supply—wells	
Treatment—chlorination	
Average demand	2.34 mgd
Plant capacity	4.0 mgd

Water Character

$CaCO_3$	247 ppm	pH	7.5
Fe	0.2	Temperature	55-60° F.

Customer Costs Per Month

3,000 gals.	$0.60
5,000 "	0.90
10,000 "	1.65

Perth Amboy, N. J.

Rates (on quarterly basis)

First 1,000 cu. ft.	$3.00	per 1,000
Next 19,000 " "	2.20	" "
Next 380,000 " "	1.70	" "
All over	0.65	" "

Minimum Charges

⅝ meter	$3.00 per quarter
¾ "	4.00 " "
1 "	6.00 " "
1½ "	12.00 " "
2 "	18.00 " "
3 "	30.00 " "
4 "	50.00 " "
6 "	100.00 " "
8 "	150.00 " "
10 "	200.00 " "

General Data

Population served	60,000
Services (95% metered)	7,200
Hydrants	550
Valves	1,500
Miles of mains	100
Service levels	2
Storage, elevated	40 mg
Supply—Wells	
Treatment—Iron removal, chlorination	
Average demand	9½ mg
Plant capacity	10 mg

Water Character

$CaCO_3$	44 ppm	pH	7.0
Alkali	29 "	Temperature	54° F
Iron	0.14 "		

Customer Cost Per Month

3,000 gals. (400 cu. ft.)	$1.15
5,000 " (667 cu. ft.)	1.73
10,000 " (1,333 cu. ft.)	3.20

Columbus, Ga.

Rates Per Month

In the city			per 1,000 gals.
5,000 gals. or less			15c
5,000 " " "	than	10,000 gals.	14c
10,000 " " "	"	15,000 "	12c
15,000 " " "	"	200,000 "	10c
200,000 " " "	"	333,333 "	9c
333,333 " "	more		8c
Out of the city			
225 gals. or less			22¼c
225 "	to	1,000 gals.	20c
1,000 "	or less than	5,000 gals.	16c
5,000 " " "	"	10,000 "	14c
10,000 " " "	"	15,000 "	12c
15,000 " " "	"	200,000 "	10c
200,000 " " "	"	333,333 "	9c
333,333 "	or more		8c

Minimum charge of $4.50 per quarter (equivalent to 20,000 gals.)

General Data

Population served	82,000
Services, 100% metered	15,157
Hydrants	720
Valves	1,122
Miles of mains	292
Storage, ground, 4.5 mg raw; 5.5 mg treated	
Supply—river	
Treatment—rapid sand filter and chlorination	
Plant capacity—24 mgd	

Water Characteristics

	Raw	Treated
$CaCO_3$	19 ppm	22 ppm
Fe	11 "	0.2 "
Mn	0 "	0 "
pH	7.1 "	8.2 "
Temperature	67	67° F

Customer Costs (in city)

3,000 gals. (400 cu. ft.)	$1.00
5,000 " (667 cu. ft.)	1.00
10,000 " (1,333 cu. ft.)	1.50

Peorians inspect refuse disposal operations at the Rockford landfill site.

Rockford Sells Peoria On Landfill Disposal

A VISIT to Rockford, Ill., was enough to convince 26 civic-minded Peorians that their open dump had to be abandoned. Last fall, the visit was to the two sanitary landfill areas that Rockford uses to dispose of its garbage and refuse. The Peoria visitors included representatives of civic groups, industries, the Association of Commerce, the press, and the City Council.

Dr. N. O. Gunderson, Rockford's Commissioner of Health, was the host and guide to the visiting Peorians. He showed them his city's original landfill disposal ground which nine months previously had been an ugly, deeply gutted limestone quarry, hopelessly sprawling with heaps of refuse deposited by private scavengers. He explained how operations would shortly turn the disposal area into a useful city park with the refuse sealed by at least four feet of good topsoil. Where originally the nearby residents balked at the thought of a "dump" nearby, he said, today they await the new improvement and look forward to its metamorphosis into a park and recreational area.

Rockford adopted this method of refuse disposal when a polio scare in 1945 aroused the public to demand the elimination of the inadequate, insanitary open dump. An engineering study of refuse-disposal methods originally led to the recommendation that Rockford use incineration. At that time, war conditions made this construction impossible. Consequently, the city turned to the landfill methods and has all but forgotten the incinerator plans.

Trench Method

In Rockford the trench method took on formidable proportions. A Link-Belt Speeder dragline excavates a trench 20-feet wide and 8 feet deep. An Allis-Chalmers tractor equipped with a Bull-Clam shovel compacts the refuse dumped into the ditch and covers it with 2 to 3 feet of good soil. The total filled-in height amounts to 12 to 15 feet.

In addition to the quarry area, Rockford uses a 5-acre tract provided by a local factory. This area was considerably below the factory level, making access from the rear difficult. In one year, the level of these 5 acres have increased by approximately 8 feet, making the area available for storage, parking, and similar uses. Once the 5 acres and the quarry are filled, Rockford can turn to 40 new areas of otherwise useless ground on the city outskirts. These areas, severely gullied and hilly, will guarantee at least 25 years of continued sanitary land-fill disposal area. In time it may then be turned into a city park.

Rockford limits dumping operations to between the hours of 8 a. m. and 4 p. m., enabling operators to cover the top and sidewall of the trench by daylight. It also specifically prohibits picking and sorting of refuse, thus eliminating unsightly appearances.

City Engineer William Day readily admits that the sanitary landfill method of refuse disposal is more costly than the standard open dump. However, Rockford officials are agreed that the increased investment was worth while.

Even so, the fill is not a financial burden to the city. Rockford charges scavengers 50 cents a load to use the sanitary landfill disposal grounds. The city itself collects from commercial houses, charging 25 cents per 30-gallon can. Rockford utilities pay the garbage department to carry away its ashes, and these the city uses to cover the refuse at the quarry dump. An income of some $6,000 per year is acquired in this way, over and above the general operating expenses.

Asheboro Surfaces Secondary Streets

Careful use of city-owned equipment results in popular low-cost street improvements

By CLIFFORD PACE
Assistant Director
Institute of Government
University of North Carolina

HOW the town of Asheboro, N. C., is dealing with the dirt-street problem (and it is a real problem in Asheboro, for the town has more than twenty miles of such streets) furnishes an excellent example of ingenuity and resourcefulness of the governing officials.

Crusher-bin arrangement eliminates the need for extra loading equipment.

Because Asheboro did not have sufficient funds from its normal operating revenue to pave its dirt streets, it worked out this proposition: if the citizens on an approved street will put up 80% of the cost of curb-and-gutter and base, the Town will, with its own equipment and personnel, contruct curb-and-gutter and lay the base. With that much done, the streets will be ready for surfacing when the funds are available, and in the meantime, will be free from mud and not nearly so dusty as they otherwise would be. Funds for surfacing the streets must necessarily come from a bond issue, and the people voted favorably on the issuance of these street bonds late in August.

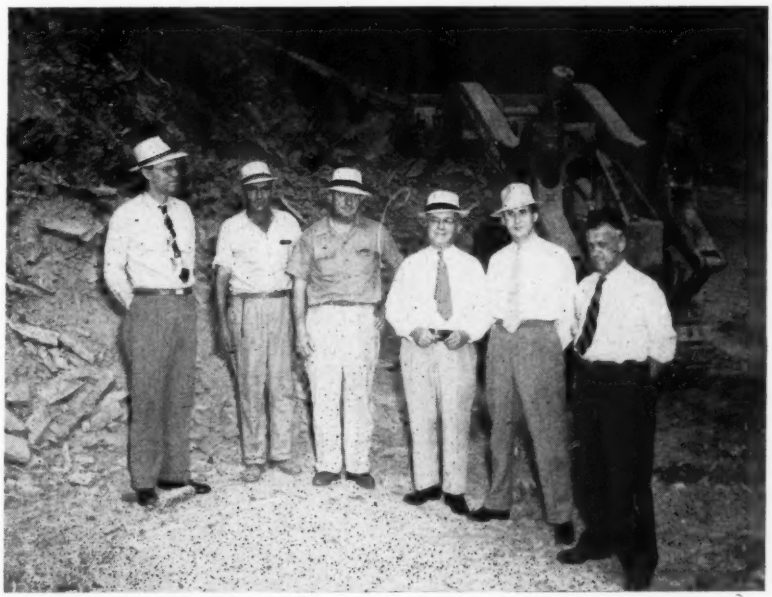
Good Supply of Stone Available

First step in performing on this agreement was to locate a cheap and ready supply of stone for base. Street Superintendent J. H. Richey located two such outcroppings of slate well suited for this purpose. He found a good quarry site and interested the State Highway Commission in the slate for base material, thus negotiating a three-way trade for the working of this deposit. The Highway Commission agreed to lease the rights to the deposit if the town would construct a road into the quarry, each to have equal rights to work the deposit; the owner of the land which had to be crossed to get to the quarry agreed to grant a right-of-way on the one condition that the town would grade her own road and put the first loads of slate on the road. The town agreed in both cases.

The problem was one of logistics—how to get the stone on the streets in the shortest possible time with the equipment and men available. The equipment consisted of trucks, one Bucyrus Erie loader-dozer, and a rock-crusher. The town had no conveyor to stockpile the stone at the crusher and no $1,800 to buy one. The crusher had to be fed and the trucks had to be loaded and one loader-dozer could not do both.

Used Natural Terrain

The ingenuity of Asheboro's Director of Public Works, W. Tom Cox, provided the solution to this problem and earned for him a letter of commendation from the mayor. Recalling that there was a



In front of the loader-dozer are Mayor W. C. Lucas, Street Superintendent J. H. Richey, Director of Public Works W. Tom Cox, Chamber of Commerce Secretary Harry Barlow, City Manager Kent Mathewson, City Councilman Ed Cranford.

high bank located on city lake property less than a half-mile from the quarry site which had roads leading both to the upper and lower levels, he reasoned that this spot was ideally suited to the purpose he had in mind. A bin could be constructed against the bank. On top, the crusher could be so fixed that stone from the quarry, which had been loaded on a dump truck with the loader-dozer, could be dumped directly into the crusher. That same truck could then proceed to the lower level, back under the bin, receive a load of crushed stone ready to go on the street and either take the stone directly to a street or go back to the upper level and dump its load on the stockpile near the bin. From this stockpile the trucks could be loaded with the loader-dozer at such times as it was not at the quarry loading the uncrushed stone, for it could be moved to the stockpile in a matter of minutes. Production is at present up to 100 tons a day and is expected to reach 125 tons. Crushed stone shipped into Asheboro from out of the state, as was formerly done, cost the town $2.33 a ton. City Manager Kent Mathewson estimates that the blue slate produced in the matter described will cost about 85 cents a ton. This saving to the town will run as high as $150 a day, and it was accomplished without the purchase of a conveyor.

On August 19, by a vote of 449 to 85, the citizens of Asheboro approved the issuance of $175,000 in street bonds, which will buy a lot more streets than would have been possible without the arrangement described. In addition to the street bonds, the voters approved $50,000 in water bonds and $25,000 in sewer bonds to provide water and sewer lines under the improved streets.

Condensed by permission from the University of North Carolina *Popular Government*.

Out of the Creamery

Onsted, Mich., builds a new water works around an abandoned creamery

THAT old chestnut about the creamery that waters down its milk gets the ultimate in Onsted, Mich., a village of about 400 people. Here, a creamery distributes nothing but water. In fact, it constitutes this community's water supply and does a good job in the bargain.

For many years this community has had a domestic water supply consisting of two shallow wells, two 50-gpm electrically driven pressure controlled piston pumps, a 4-foot-in-diameter, 10-foot-high expansion or pressure tank, and about 8,400 feet of 2-inch to 1-inch galvanized iron distributing mains. The wells are located in the center of the business district and furnish a fairly hard water with an iron content of 4 ppm—entirely too hard for any normal domestic use.

Last year the community decided to correct this difficulty and embarked on a large-scale — for Onsted — water-improvement program. Village officials purchased the site of an abandoned creamery containing an 8-inch well 154 feet deep. This was cleaned and pumped to show a yield of 200 gpm at a pumping level of 60 feet and a static level of 30 feet. Analyses gave a total hardness of 295 ppm and 1 ppm of iron. The improvement program covered the entire removal of the old creamery and replaces the old galvanized iron distribution system with a new cast-iron system large enough to give adequate fire protection.

The work specifically included:

One 50-gpm electrically driven float-controlled deep-well Pomona pump.

Two 50-gpm electrically driven pressure controlled Buffalo pumps for distribution service. These operate against a 125-foot head.

One 500-gpm electrically driven manual-controlled Buffalo fire pump that can operate against a 125-foot head.

One pressure or expansion tank, used in lieu of an elevated tank.

One 50-gpm Permutit pressure filter for iron removal.

The Pomona deep-well pump delivers its water through a diffuser and a system of spray pipes to the reservoir. This pump is so piped that it can also deliver its water to the distributing system through the pressure filter or directly to the distributing system.

The Buffalo Pump service pumps, one of which is a spare, deliver reservoir water through the filter to the distribution system. The fire pumps, also from the Buffalo Pump Company, deliver reservoir water directly to the distribution system and are also used to backwash the float controlled filter.

A complete distribution system was designed. Because of cost, however, it was not all completed. At this time the community laid 2,800 feet of 6-inch cast-iron pipe with leaded joints, paralleling the existing small pipes, and installed seven fire hydrants. Connections were also made to the remainder of the smaller pipes so that all pre-existing connections have service.

The improved plant has been in service since September of last year. It pumps an average of about 20,000 gallons per day, or 50 gallons per capita.

The work was designed by A. H. Smith, consulting engineer of Toledo, Ohio, who furnished the information used in this article. G. H. Leach Company of Bellefontaine, Ohio, was the contractor, with H. C. Bever in charge of the project. The superintendent of water of Onsted is Alfred Lapham, who is also the street commissioner.

The former creamery at Onsted, Mich., has been converted to a water works.

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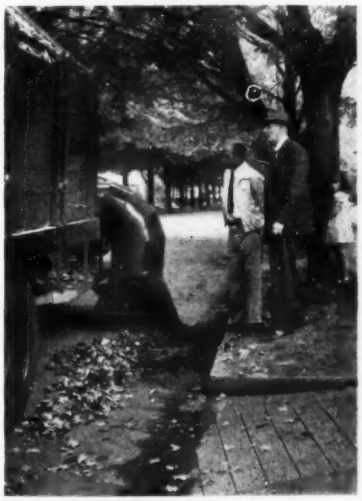
This shows the leaf loader converted to a tree sprayer.

Double-Duty Leaf Loader

A vacuum leaf loader extends its duties by undergoing minor alterations in the summer and becoming a mist blower for tree spraying and mosquito control



Park Superintendent Walter, left, and Street Superintendent Rodgers supervise loader's leaf-gathering operation.

MAPLEWOOD, N. J., has a vacuum leaf loader that changes its function in the spring and summer months to that of tree sprayer. The dual duty of the American Structural Steel and Tank loader represents cooperative action between George Rodgers, Superintendent of Streets, and Richard Walter, Park Superintendent, and has worked to the advantage of both.

The use of the blower, while speeding operations appreciably, has produced some problems that Superintendent Rodgers feels he has now solved. One of these was that of dust produced as the blower exhausts into the awaiting truck. The other was the matter of fires that would result when the leaf loader would pick up the residual of a small leaf bonfire lying in the gutter, and fan it into a bad fire.

The loading problem required a little concentrated attention on the matter of a truck body. Originally the truck receiving the leaves had its body covered entirely with burlap; but the big 16,000-cfm blower exhausted air into the body so fast that it actually blew the light burlap body off the truck. Superintendent Rodgers biult a new body of sheet aluminum and left at the top a panel 4 feet wide extending the length of the body. This panel he covered with ¼-inch mesh galvanized wire, thus making it possible for the air to exhaust upward, and in effect help hold the body on the truck.

The problem of fires was operational rather than structural. Superintendent Rodgers first sprinkles the leaves and then has his crew rake them from the gutter. He could move the leaves with a gutter broom of a standard street sweeper if he had one.

The machine can collect 10 cubic yards of leaves in less than one hour, whereas he had to allot himself half a day when his regular crews were doing this by hand. Moreover, the 10 cubic yards gathered by the blower is more dense than are leaves shoveled into a truck by hand loaders.

All the leaves are collected from the streets and are saved by Park Superintendent Walters, who composts them into a rich fertilizer.

Superintendent Walters' adaptation

of the leaf loader into a tree sprayer was direct and effective. He removed the suction pipe from the blower that led to the gutter, and covered the blower inlet with a heavy wire grill to insure that no one would put his hands into the impeller blades. Then he placed a 3-foot-long, 12-inch-diameter Flexible rubber pipe with a set of spray nozzles at the outlet of the blower, using ordinary furnace spray nozzles for most of his work. He mounted a small Hardie sprayer on the truck and connected it to the spray nozzles to supply the insecticide to the trees. Normally he uses a DDT-rotenone combination known as Dapstray, which is particularly effective in destroying the elm leaf beetle, Japanese beetles, and other leaf-eatng insects.

By using this mist-sprayer on the trees, he can do in five days the work that normally requires four weeks. He can produce a mist that blankets the trees, and at the same time can easily maneuver around parked cars and reach the tops of tall trees.

My Local Taxes Are Too Low

The author of this article is active in promoting public understanding of Saginaw's financial problems. One of his recent efforts along these lines was "The 15-Mill Amendment," a privately printed pamphlet now in its second edition, which described the effects of the Michigan State Constitution provision on the tax structure of Saginaw.

By CARL J. FAIST
Director of Finance
City of Saginaw, Mich.

I AM an ordinary citizen in a typical American city, Saginaw, Mich. My salary is $5,880 a year. I live in a house which is assessed at $4,250. Last year (1947) my taxes were: city (including water bills), $50.54; school, $26.79; county, $17.85; federal (including income tax), $1,079.60.

For my city tax of $50.54 a year I get police protection for myself and family, my home, my car, and bank account. I get fire protection day and night the year round for my house and its contents. I get safe, pure water delivered to my home and the sewage removed. I get traffic lights to drive by, street lights, bridges, sidewalks, pavements, voting facilities, and a goodly number of parks and playgrounds. I get health protection through the city's food, milk, restaurant, and sanitary inspection.

Last night I enjoyed a fine free concert by our municipal band. Twice during the past year I have been given valuable information by our City Clerk. The street in front of my house was cleaned ten times last summer, and the snow was removed six times last winter.

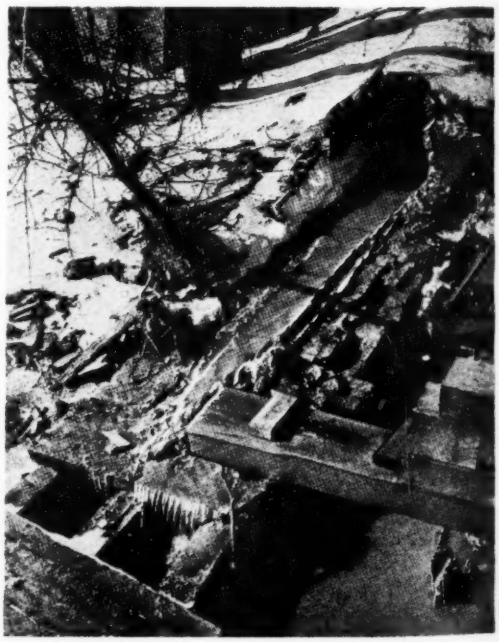
For my school tax of $26.79 a year I have been permitted to send two daughters through grade school and high school. There they learned the elements of music, sewing, first aid, cooking, and dramatics, as well as arithmetic, grammar, English and American history, geography, and spelling. They received sound physical training, learned to swim, dance, play volley ball and baseball, and periodically had their teeth, eyes, ears, and lungs tested for possible defects.

For my county tax of $17.85 a year I have available to me the services of a circuit court, although only once in the last ten years has it been necessary for me to appear there. That one time I saved not only $500 but what I felt was my good name and reputation. Several times during the war I obtained copies of birth certificates from the County Clerk. I have had three deeds and four mortgages recorded there. One year it was necessary to have my mother's will probated; it was done by the County Probate Court for a very nominal fee.

These services, performed for all the other citizens of this town as well as for me, determine the community in which we live. It is a good community. We like it here. We chose to live here, after some roaming around, because we liked it better than bigger cities or smaller cities, and we expect to stay here. I hope my children will marry and live here, so we can enjoy our grandchildren here too. I feel I am a part of this community and I want to pay my share of what it costs to live here.

Come to think of it, the health, safety, and education of my children are mighty important. Three of the biggest goals in my life. And my local government provides them all, at a cost last year of $95.18—less than I paid for cigarettes!

The emphasis in recent years has been upon national citizenship. Is it not important also to recognize our local citizenship, and the allegiance we owe to our local governments—city, county, and state? In the final analysis it is on the local levels of government that the democratic ideal of self-government rests. If we wish to continue as a self-governing people, the thing to do is to strengthen our municipalities, and support them better with our dollars and our personal participation in community affairs.



This photo by *The Saginaw News*, reproduced in "The 15-Mill Amendment," is displayed as evidence of the need for increasing municipal taxing powers and sources. It shows a sewer emptying into the Saginaw River. The caption states: "For 20 feet the top of the sewer has collapsed, indicative of the replacement work needed on Saginaw's system. In the fetid fluid, ugly water rats prowl in search of food." Improvements in the present sewerage system and treatment works have been ordered by the Michigan Stream Control Commission.

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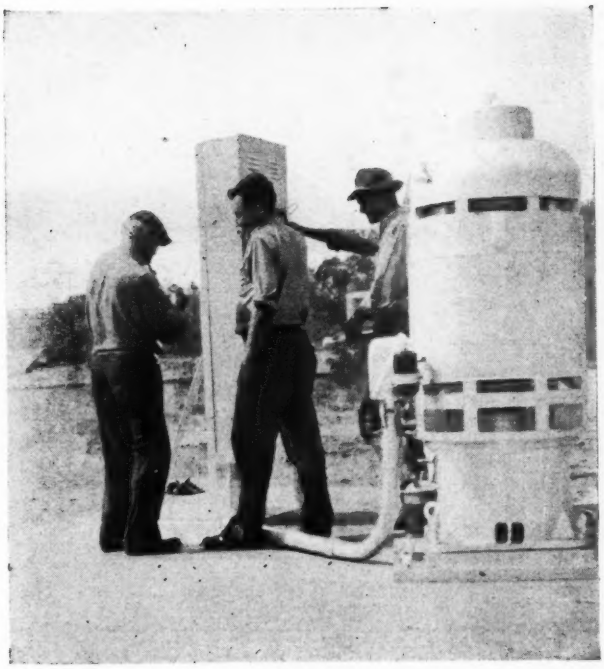
A Five-Year Well Project

Sierra Madre, Calif., completes work on a well delayed by the war

By **JOSEPH T. SWANSON**
Water Superintendent
Sierra Madre, Calif.



Water department and pump company officials make a final inspection of the new pump before it goes into service.

IT TOOK five years for Sierra Madre, Calif., to get its new well into operation. But the five-year delay was the result not of civic oversight, but of a world conflict in which the delay in building a well for Sierra Madre was one of the least of the problems confronted.

Construction of the well went forward originally in 1942. The shaft was first dug by hand to a depth of 165 feet, then drilled to a depth of 650 feet. The starting shoe sets in hard clay and boulders. The depth at which the water was first found was at 200 feet.

By the time the city was ready to advertise for bids, war was declared. Since work could not go forward on the well, it was sealed to avoid any possibility of contamination. Prior to sealing, the well was tested by the driller with a belt-driven pump. At the end of 30 hours the well produced 1,500 gpm.

Early in 1947, the city called for bids on the installation of a new pump for this well. Engineers and water superintendents from surrounding cities were very skeptical about bringing the well in after such a long period of inactivity. However, on completion of the installation, the engineer who installed the pump stated that no surging would be required. Within 10 minutes the pump was delivering its 1,500-gpm rated capacity. The pump is a Byron Jackson deep-well type. It is a 7-stage bowl assembly on a 12-inch standard column 300 feet in depth. This makes the third deep-well pump for the city and gives us a yield of 4,600 gpm.

Last fall, the Edison Company made a test preparatory to a cycle change ranging from 50 to 60 cycles. The test shows that the pump can furnish water at 1,600 gpm easily. Contrary to expectations, no sand has been pumped. This probably is due to the louvre perforations in the well screen.

The city also owns two tunnels that in normal rainfall years will deliver approximately 850 acre-feet per year, enabling the city to shut down the pumping plant for three to five months per year, according to the precipitation. The water from these tunnels is pure mountain water and many of the visitors from the beach cities bring five-gallon bottles to fill with Sierra Madre water.

A "Boulevard" Division

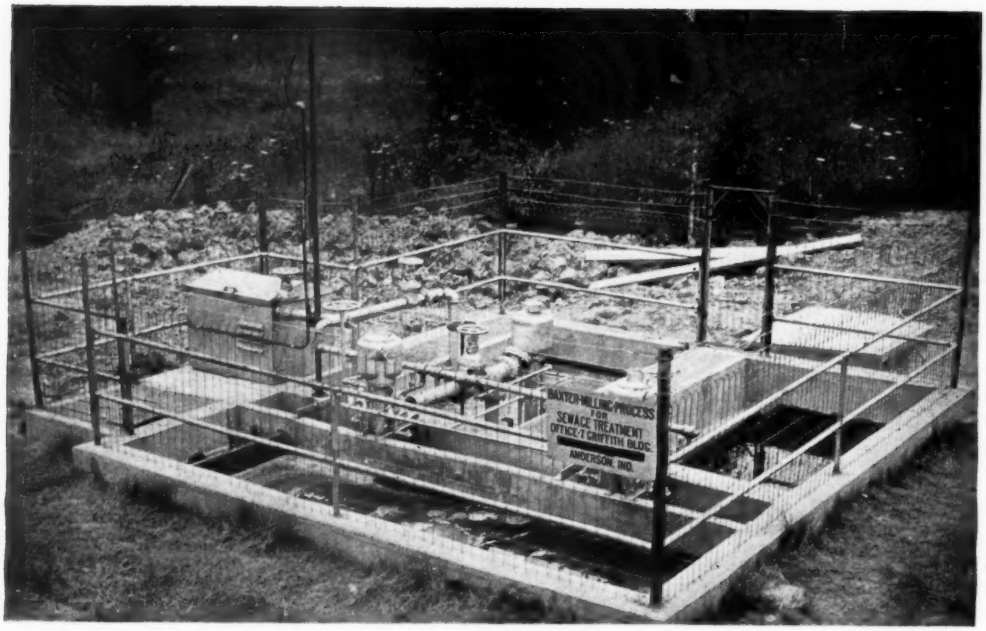
DID you ever hear of a Boulevard Improvement Division in a water department? E. L. Filby of Black and Veatch, consulting engineers of Kansas City, Mo., ran across such a division, or at least such an activity, during a trip that took him through Havre, Mont.

In this city, located in a semi-arid part of the country, the water department maintains 16 men working 44 hours a week sprinkling the lawns between the curb and property line, and maintaining it in a fine condition through mowing, weeding, and watering. This water is not metered and of course runs into considerable gallonage per day, but the green lawns in contrast to the brown appearance of the surrounding country is refreshing and makes living "in town" attractive.

This service is charged to the abutting property owners, and the "boulevard men" have just enough work to keep them busy and interested in the appearance of the city. The property owners naturally keep their yards on a par with the boulevard areas, and give their city a clean, pleasant appearance.

The distribution system has 102 ¾-inch services and 308 1-inch services, largely of lead, which is being gradually replaced with copper. The system has been in use for several years. The present water supply came from four wells about 90 feet deep, pumping directly into the distribution system. The water is quite hard and presumably from the ancient bed of the Missouri River. Black and Veatch is reporting on a water supply development from the Milk River for Havre.

The water department is operated under the supervision of J. E. Haugen, City Engineer.



The plant has shown ability to treat satisfactorily sewage from highly variable population loads.

An Activated-Sludge Improvement

By MARTIN A. MILLING
Consulting Engineer
Anderson, Ind.

OUT of research conducted over the past years at Anderson, Ind., has come a development in the activated-sludge type of treatment that the writer feels will cut the cost of treatment and bring the advantages of sewage treated to a high degree of purity within the pocketbook limitations of small cities, towns, institutions, and resorts.

The treatment has been tested in pilot scale for several years at the Anderson, Ind., sewage-treatment plant under the direction of R. R. Baxter, superintendent of sewage treatment. It also has had full-scale tests at a plant serving a resort area where it had to handle population loads varying from 1,000 to 4,000 per day. It showed ability to remove consistently 85 to 95% of the suspended solids and BOD loading and to produce an effluent that is clear and sparkling.

The Baxter-Milling Process, so named because it was developed jointly by Superintendent Baxter and the writer, does for the activated-sludge process what the high-rate trickling filters did for the old standard trickling filter. The high-rate filter increased the capacity of the standard trickling filter from 2 mgd to 20 mgd, treated through the same volume of filter stone. This increased capacity of the trickling filter was accomplished by better distribution of the sewage over the surface of the filter bed, which resulted in bringing the sewage in continuous contact with slimes of living organisms covering the surface of the filter stone.

If the efficiency of a trickling filter can be increased 10 times by applying the sewage more uniformly to the filter stone, similar results should be obtained in an activated-sludge plant if the incoming sewage and the returned sludge were applied more uniformly to the liquor in the aeration chamber, instead of at one point and at one end of a long tank as now practiced. The same type of organisms required for decomposing the sewage inhabit the aeration chamber and the trickling filter; both require oxygen and food. Thinking in more everyday terms, it would seem just as unreasonable for a farmer, when feeding a pen full of pigs, to place all the corn in one corner of the pen as it would for a sewage-treatment plant to be designed for the sewage to enter at one corner of a long aeration tank.

The aerator operation can be seen from the drawing. Incoming sewage that has passed through the primary settling tanks enters the aeration chamber through a slotted bottom trough. This way prevents sludge deposits in the troughs and insures uniform distribution along the length of the aerator. Long aerators, of course, will require more than one influent connection to the trough.

As the liquid circles in the tank, it passes the slotted-bottom trough and brings a thin sheet of incoming sewage into it. This produces a thorough and uniform mixture and brings all fresh sewage particles in contact with the aerobic organisms present in the aerated liquor. Thus the process of decomposition begins immediately.

As each particle of sewage enters the aerator, it is immediately attacked by swarms of organisms. These organisms ride the sewage particle, so to speak, around and around through the aeration chamber, under uniform environmental conditions, and finally the particle may start up through the clarifier chamber. The clarifier is constructed with sloping sides which facilitate the return to the aerator of settleable solids and causes the velocity of upward flow to decrease as the width of the clarifier increases, so that at a point the particles, being slightly heavier than water, will cease to rise. Other particles do likewise, and soon there is formed a blanket of particles. The sludge blanket forms an artificial filter resembling a brownish-colored

More even and direct feeding of return sludge is featured in this new high-rate activated sludge system

cloud, floating down below the liquid surface, through which all liquid must pass before it reaches the effluent trough and travels thence to the stream This action results in a clear effluent.

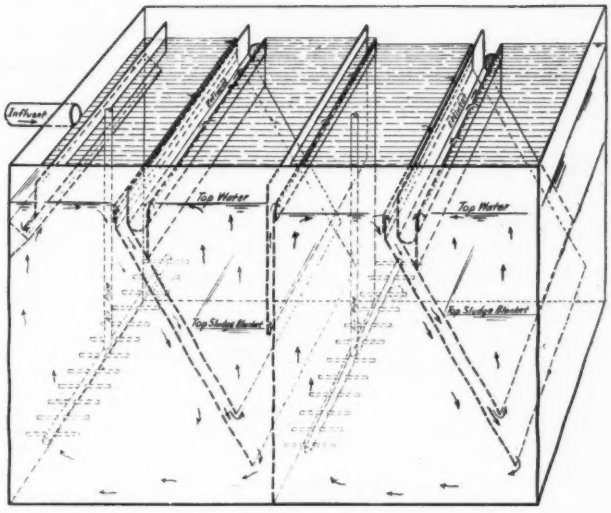
As the operation continues, more particles cling together with a resulting increase in their specific gravity, and their automatic return to the aeration chamber in a fresh and active condition and at a uniform rate all along the length of the aerator. These returned solids will continue to accumulate and increase the solid-content percentage of the aerator liquor.

To automatically regulate the height of the sludge blanket and therefore the solids-concentration percentage in the aerator, it is only necessary to control the height of the sludge blanket. This is done, as can be seen in the picture, by an adjustable baffle in the clarifier placed in front of the center vertical division wall, which is provided with an adjustable overflow weir.

The suspended-solids percentage in the liquor siphoned from near the bottom of the clarifier below the top of the sludge blanket will usually be about twice that of the liquor in the aerator. With this assumption and knowing the suspended-solids percentage in the incoming sewage (usually about 100 ppm), it is easy to calculate the minimum flow that should be wasted over the weir to the second aerator. For example, under the above conditions the liquor going over the weir into the second aerator would have a suspended solids content of 2,000 ppm, and the flow would amount to 1/20 of the incoming sewage flow. The other 19/20 of the sewage flow would be filtered and clarified and thence discharged into the effluent trough and to the receiving stream, clear, sparkling, and with 85 to 95% of the BOD and suspended solids removed.

Having disposed of 19/20 of the sewage flow, the next problem is to dispose of the remaining 1/20 of the sewage flow together with the 2,000 ppm suspended solids which has now been siphoned over into the second aerator-clarifier unit for second-stage treatment. Now if the second unit is the same size as the first unit, which provided the usual detention period of, say, eight hours, then there would be a detention period of 8 times 20, or 160 hours, for the liquor in the second unit.

The solids could be further concentrated to as much as or more than 20,000 ppm (2%) by the automatic return of settleable solids from the second clarifier as previously described under the first-stage treatment. This would give a total of 10 times 160, or 1,600 hours (66 2/3 days) aeration of the solids in the second stage, which is obviously more time than necessary to stabilize the organic solids. In practice it is recommended that the second aerator-clarifier unit be made smaller or that the flow through it be increased, thus increasing the over-all efficiency and capacity of the sewage-treatment plant.



The layout shown uses a two-stage-treatment arrangement.

The picture shows a sewage-treatment plant of the Baxter-Milling Process built for a camp ground near Marion, Ind., and placed in operation during the summer of 1947. The plant was designed for a camp population of 1,500 and a sewage flow of 30,000 gallons per day. Including the primary settling tank, the over-all size of the plant is 18 feet by 18 feet by 10 feet.

The maximum population of the season was on Sunday, August 10, 1947, at which time it was estimated that there were 4,000 people at the camp.

The Marion camp grounds plant turned out a sparkling clear effluent (90.4% to 98.1% efficiency in BOD removal) even though it was operated under very adverse conditions. Not only did the population of the camp vary from a few hundred to as much as 4,000, but during the height of the season a large septic tank was taken out of service and its contents discharged through the plant. The plant cost only $8,000, which with a population of 1,500 would amount to less than $5.50 per person.

On this day the flow was measured and found to be 30 gallons per minute, or 43,200 gallons per day. The day being Sunday, samples were not taken, but were taken a few days before, and also a few days after by the Indiana State Board of Health. The following is a copy of the BOD results of an analysis of these samples given in a report dated January 7, 1948, prepared by George K. Erganian under the supervision of Paul W. Reed, Sanitary Engineer of the Indiana State Board of Health:

	Date of Sampling	
	Aug. 7	*Aug. 14*
Estimated population	1,200	300-400
Type of sample	24 hr. comp.	8 hr. comp.
Volume of flow	18,100 gpd	15,000 gpd
Aeration period	10.4 hrs.	12.2 hours
BOD of raw sewage	115 ppm	151 ppm
BOD of settled sewage	97 ppm	78 ppm
BOD of final effluent	11 ppm	3 ppm
BOD removal by secondary units	88.8%	96.3%
BOD over-all efficiency of plant	90.4%	98.1%

The City Tells Its Story

By HENRY DAVIS NADIG, *Director of Public Relations, New York Regional Plan Association*

Birth and Taxes—Things That Count; Also a Dangerous Precedent Noted

SOME are born with civic consciousness, some acquire civic consciousness, and some have civic consciousness thrust upon them.

Down in Seminole, Texas, Mayor D. Hoyt Starling aims to see that all newly arriving Seminoles are practically born with it—so that civic consciousness comes as close to being a natural trait as possible, should it be not actually inborn.

You might say that Seminolians are now born with a tax assuager in their mouths—for, indeed, if a city government is so Municipal Public Relations concerned that it bows to the basinet (see illustration below) in welcoming a taxpayer-to-be, such a gesture is going to be remembered by the parents and not forgotten by the youngster.

You think maybe I'm spending too much time and space on a simple little thing? The simple things take time and effort—but how they pay off! It's the little things that count—with cities as with people.

No Politics in MPR

But MPR can't produce for the best interests of the city in the long run if it is tied up with political strings. What brings this up is a development in a certain large city where it was recently reported that an attorney has been appointed as public relations director. It came about apparently as a result of requests from a few city department heads for funds to publicize their activities.

The Aldermanic President was said to have recognized that it would be sensible to get one man to "coordinate the work for the entire administration." The Mayor was reported to have said that the MPRD would not be paid by the city but with funds of the dominant political party.

Both of these bases for MPR operation are absolutely wrong from the very fundamental principle of sound, efficient, honest MPR.

MPR is a *municipal*, a *city-business operation*. It should go on *regardless of political changes*. It therefore *must be supported by tax money*, not by party funds. Or else the MPR appointee is subject to the tides of political fortune and the MPR accomplishment becomes fettered by prejudice.

This is a matter of principle—democratic principle, with a small "d." And the principle must be staunchly driven home at this early stage of MPR growth.

And this question is not new, though MPR in the United States is only beginning to be recognized for the values it holds for every city. A number of times the thought has been expressed to me that MPR might well become a tool of party or administration politics.

The answer lies in two directions—on the one hand with the quality of the MPR man himself and on the other with the character of the city government. Neither can honestly acquiesce to political usage of MPR.

There's no place for party politics or political propaganda in good Municipal Public Relations.

Getting back to little things, you can probably think of a host of small gestures that could be accomplished without much effort by your own city, things that would pay off in better citizen response and cooperation with your department or your city government as a whole.

Take taxes. More and more the little matter of telling the citizen plainly about the big problem of taxes is being handled by tax departments in a simple, plain-talk manner — certainly a little enough thing to do to create understanding, better cooperation and more tax money.

The Public Administration Clearing House, at 1313 East 60th Street, Chicago 37, has reported that local taxpayers generally are getting a better explanation than ever before of how their tax dollars are spent. The Municipal Finance Officers Association (also at 1313) notes a trend toward briefer, more graphic, and more readable financial reports.

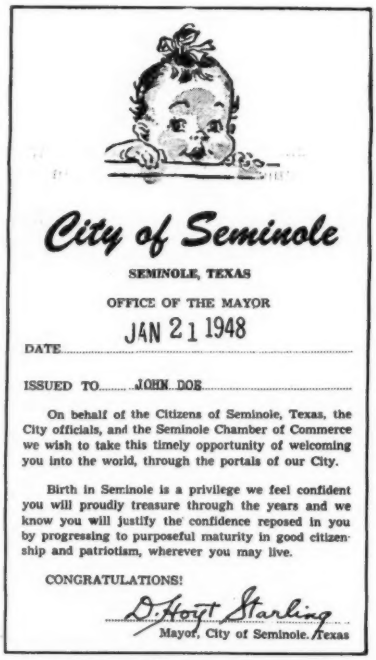
What is important, too, is that little bit of graphic explanation of the why and the wherefore of the tax dollar sent out with tax bills by a growing number of cities.

Give John Q. a good plain picture of where his tax money goes and he isn't going to crab quite so much. Charts and graphs and pictures, along with a few figures, in an eye-catching leaflet are worth a lot more than galleys of solid eight-point type.

An Idea

Remember the use of ads was one of those queries in our recent MPR questionnaire sent to city managers? Perhaps you can take a tip from Tax Assessor Howard W. Schroeder of Sedgwick County (Wichita), Kans. He saw that some promotional advertisements for church attendance were getting results and thought he'd try out tax ads on the public. So he set an ad agency to work producing ads designed to break down the public's general antipathy to taxpaying. After their appearance, the tax take started increasing.

Just a little thing like that! The cost? Some Wichita firms saw two advantages in underwriting the ads, since if more taxpayers paid up it would lighten the load on each one, and it brought an



City of Seminole

SEMINOLE, TEXAS

OFFICE OF THE MAYOR

DATE JAN 21 1948

ISSUED TO JOHN DOE

On behalf of the Citizens of Seminole, Texas, the City officials, and the Seminole Chamber of Commerce we wish to take this timely opportunity of welcoming you into the world, through the portals of our City.

Birth in Seminole is a privilege we feel confident you will proudly treasure through the years and we know you will justify the confidence reposed in you by progressing to purposeful maturity in good citizenship and patriotism, wherever you may live.

CONGRATULATIONS!

D. Hoyt Starling
Mayor, City of Seminole, Texas

Creating civic interest right from the cradle is this neat little bit of MPR, a card sent from Mayor D. Hoyt Starling's office to each "new citizen" of Seminole, Texas.

XUM

opportunity for public service through their own advertising schedules.

As I have mentioned in previous columns, cities can well take advantage of the techniques used by industry to create public interest, good will, and cooperation. The utilities, particularly the telephone companies, provide good examples with the leaflets and fliers sent out with the bills. Not all of them get read, but a good share of them do—enough to make it worthwhile.

Competition for Interest

It is not sufficient to do these things just once, or just once in while. Does a merchant or a corporation advertise just once? Not if he is in competitive business.

Your city is in the most highly competitive business—the business of getting a share of the citizen's attention, which countless other interests are constantly demanding. And if your city is worth anything, it is worth while to go out after some of the citizen's interest in a professional, expert way.

That is why every bill that goes out from City Hall should be accompanied by some little thing of interest-catching nature. Some leaflet, some little one-sheet, into the making of which a bit of imagination and inspiration has gone, another and still another effort to pull just another ounce of citizen interest. That is why more and more cities are doing just that. They know it returns not only more willing tax money but the best kind of interest besides.

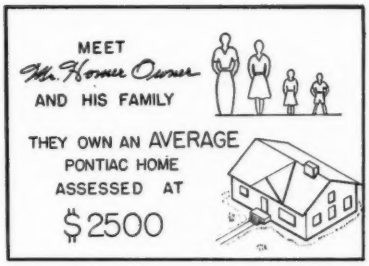
Village Clerk Robert Kent of Williston Park, N. Y., has sent along a folder which he notes was mailed out with water bills. This is a simple leaflet, all small-type text but well spaced for readability, listing the officials and employes, giving a brief history of the village, setting forth its assets and progress.

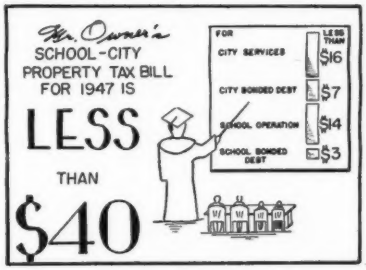
A folder like this is something that will not generally be thrown away. It will be kept for reference both for family use and for helping to give the family's guests a better picture of the town in which they are visiting. Another little thing of value—and costing little, too.

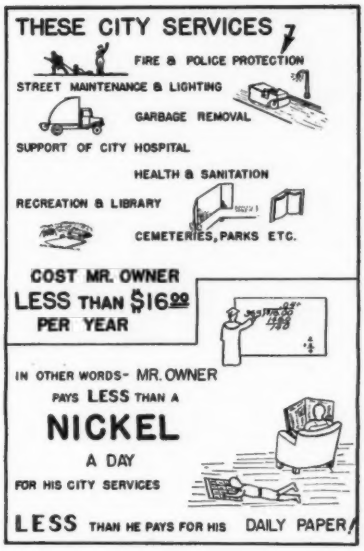
You have already noticed that these "little things," to which I've referred, all pertain to the printed word or picture. That is the medium most readily available to you, the easiest to accomplish in a mass manner, the most tangible way you can reach all citizens to gain some of that attention from other interests.

In the other media of MPR there are also many little things that the citizen would appreciate but that the official generally fails to capitalize on—from an increase of school participation to more courteous police officers; from a bit of information given graciously at the right time to the corrective quickly applied.

But, just for now, take this one little thing. Make it work. Don't be scared of a printing-budget rise. You can keep it reasonable. Watch it pay off for you and your city. From examples of what others are doing, take a cue and adapt it to fit your needs. The other little things, which you may be thinking of already, are bound to come in due course.







Here are examples of what two municipalities are doing to give their citizens a little more attention and information in the matter of taxes. The leaflet above was sent to the residents of Pontiac, Mich., dramatizing city-service costs. The front page of the little folder graphically shows that "Prices May Be Up But This Tax Bill Is Down!"

The City of Cranston, R. I., sent out the graphic folder (below) pictorializing disbursements.

THE TAX DOLLAR ON YOUR HOME *

These figures are based on the tax you pay on your home. The average of the estimated assessed value of the homes in The City Of Cranston is $5000; at this rate you pay the average of $10.00 tax per month for your home. The following tabulation is what the home owner pays for the various services rendered by the city in return for his taxes.

SERVICE	PER MONTH	SERVICE	PER MONTH
General Officers and Offices	.70 2/5¢	PUBLIC WELFARE	.38 1/2¢
POLICE PROTECTION	.60 7/10¢	EDUCATION	$4.36¢
FIRE PROTECTION	.62 3/10¢	LIBRARIES, PUBLIC PARKS, BOARD OF RECREATION, HOSPITALS, CONTINGENCIES	.31¢
PUBLIC HEALTH AND MILK	.06 1/5¢	CITY PLAN COMMISSION	.01 3/5¢
PUBLIC SANITATION	.09 2/5¢	MUNICIPAL INDEBTEDNESS	$1.50 1/5¢
PUBLIC WORKS	.98 4/5¢	FIREMEN'S PENSION FUND	.02 1/10¢
SEWER DEPARTMENT	.31 4/5¢	VETERANS' RE-TRAINING AND RE-EMPLOYMENT	.01 1/5¢
		TOTAL	$10.00

* Figures based on 1946 expenditures

Full financial report available at City Treasurer's Office, City Hall

Architect's sketch of the projected New Orleans union passenger terminal.

Three Municipal Railroads

New Orleans, La., Cincinnati, Ohio, and Belfast, Maine, all find ownership advantageous

ALTHOUGH many municipalities have shown interest in promoting railroad development schemes and have used public funds for such purposes, few such ventures have successfully survived. But New Orleans, La., Belfast, Maine, and Cincinnati, Ohio, are three cities still engaged in unique railroad programs.

Interest in the New Orleans railroad situation has been keen since contracts were recently signed for the building of a new union passenger terminal to cost $17.2 million. The Public Belt Railroad of the city is empowered to issue $15 million in revenue bonds for the terminal's construction, with the nine passenger-carrying railroads that enter the city adding $2.2 million in cash.

The new municipally owned terminal will replace the five passenger stations now in use, and make possible the removal of many miles of track. The consolidation plan, said to be the key to the city's traffic improvement program, will eliminate many of the 144 hazardous railroad grade crossings. The number of crossings will be reduced to 28, and these will be made safe by overpasses and underpasses. A separate city bond issue of $12 million has been authorized for this grade separation program. Removal and rearrangement of tracks will also make possible the clearing of several freight yards in built-up areas, the development of a superhighway, the filling of a 5-mile canal that bisects the city, and many other beneficial projects.

The unique method of financing for the terminal calls for the revenue bonds to be amortized through payment of rental by the railroads over a 50-year period. The city and the Belt Railroad are forbidden by law from ever paying a cent on these bonds. Even should the railroads default on the bond payments, the city will not lose the property, as the purchaser will acquire only the right to operate the terminal until 1998. The railroads benefit in that the terminal will be tax-free for 50 years and in that the municipal bonds can be sold at lower interest rates. The city benefits by the building of a station that has been in the talking stage for two decades.

The construction of the new terminal will, of course, be helped along by the Public Belt Railroad's bonding powers, authorized through a state constitutional amendment. But the city's long history of successful ownership and operation of its Public Belt Railroad system and the experience gained in the venture may also have been a factor in aiding the new terminal's promotion. It fostered a respect for railroad problems and provided a firmer basis for negotiation between municipal and railroad officials on a project requiring not only engineering and financial skill, but statesmanship as well.

Created by municipal ordinance in 1900, the Belt Railroad has been a major factor in fostering the port operations of the city by expediting the transfer of goods between rail and ship facilities. It was formally opened on August 3, 1908, with one switch engine and 20 miles of track, but it has grown steadily as the port has expanded. Today its shuttling of box cars is the means by which a flood of goods rolls to and from 128 industries and 12 miles of wharves along 128 miles of track. In 1947 the Public Belt handled some 205,000 revenue cars, an increase of 34,334 over 1946.

The Belt's Organization

The Public Belt Railroad is operated by an independent commission consisting of the mayor and 16 citizen taxpayers who serve without pay and represent various trade bodies. Although the state of Louisiana created a separate agency to manage the public wharves in 1921, it specifically authorized the city to continue the railroad's management. The city appropriated $400,000 for construction and operation between 1905 and 1911, but other capital improvement costs have been paid for through the issuance of revenue bonds.

Under the able direction of General Manager Edmund J. Garland, the Public Belt Railroad is noted for its efficiency, its low switching rates, and for its avoidance of delay or discrimination in the handling of cars for either large or small shippers. The Belt's basic principle is "service first," and its financial

XUM

record is excellent. Rolling stock now includes nine diesel-electric and seven oil-burning steam locomotives, as well as fourteen cars used in local service. With 494 employes, it also operates a modern roundhouse and car-repair shops, and includes in its trackage 84 miles of yard tracks and sidings.

Pride of the Belt is the rail-highway Mississippi River Bridge, 4.4 miles long, which it owns and operates. The $13,000,000 bridge was financed jointly by the Belt and the state through the issuance of revenue bonds. The Belt bonds are being amortized through bridge rentals paid by the Texas and New Orleans Railroad, and in 1954 these bonds will have been completely paid off. The people of New Orleans will then own a debt-free bridge without a cent having been paid for it from the city treasury or Public Belt funds.

Belfast's Own Railroad

A smaller-scale municipal railroad operation is that of the City of Belfast, Maine, which owns the Belfast and Moosehead Lake Line running between Belfast and Burnham Junction, a distance of 33 miles. Operated by a civic committee of merchants and other businessmen of the city, the railroad has a record of excellent passenger, mail, and freight service.

A recent analysis of the City of Belfast's bonded indebtedness by Norman W. Mosher, a student at the University of Maine, revealed some interesting facts about the city's financial structure and its ownership of the railroad. The analysis shows that abandonment of the railroad would do nothing to alleviate the debt and would be of definite harm to the community.

"Actually," stated Mr. Mosher, "the existence of the railroad is in part responsible for the maintenance of a large part of the tax base. Without the railroad, certainly some of the industry would relocate at the earliest opportunity, and new industries would not be as readily attracted to the area." Mr. Mosher pointed out that although the city realizes no direct income from the railroad, neither does the railroad cost the city anything to operate.

Built in 1960's

The Belfast and Moosehead Lake Railroad was built in the 1860's, with the city issuing bonds in the amount of $500,000 for the purchase of stock. As soon as the line was completed, it was leased by the Maine Central Railroad, which operated it, using its own equipment and rolling stock. With the lease rental, the railroad paid yearly dividends. However, in 1886 a violent controversy resulted over the disposition of these dividends. The city was divided into two factions, one group believing that the excess should be used for municipal purposes to lower the tax rate after interest was paid, and the other group declaring that the excess should be used to retire the bonds.

Tax-Reducers Won Out

"Unfortunately for present citizens of Belfast," Mr. Mosher writes, "the tax-reducers won by a margin of two votes, and the controversy was never brought up again. The dividends were not used to retire the debt."

The debt was carried from year to year until the Maine Central Railroad relinquished its lease of the line, leaving the City of Belfast with a railroad having only a roadbed, right-of-way, and station buildings, and with no equipment or rolling stock. The Belfast and Moosehead Lake Railroad then borrowed money, bought secondhand equipment, and has been operating since 1926. It has paid its loans but no dividends since that time. Two new General Electric 70-ton diesel-electric locomotives now supply the railroad's motive power. The city still holds the $500,000 of capital stock and, since 1926, has been engaged in the long, arduous process of reducing the bonded debt, of which the railroad represents the major share, bequeathed to it by its forefathers.

Cincinnati's Railway

A different story is that of Cincinnati's municipally owned railway, which extends from that city to Chattanooga, Tenn., a distance of 335 miles. The railway has been an outstanding success, with the 1946 sinking-fund statement of the city showing an excess of rent over interest since the building of the road of $16,607,444.

The city, however, has never owned any rolling stock. Operation has been under a lease to the Cincinnati Southern Railway Company. The original state legislation empowering Cincinnati to borrow funds and to use them in constructing its own road provided for the appointment of five trustees by the Superior Court of Cincinnati to be responsible for the railway's construction and leasing. The present lease arrangement extends to the end of the year 2026, with periodically increasing rentals. The lease consists of three elements:

1. A fixed rental of $1,250,000 plus the Trustee's expenses.
2. Interest and sinking-fund payments on terminal and betterment bonds.
3. The equivalent of 2% of the net profits of the operating company. During the last twenty years of the lease the fixed rental is to be $1,700,000, and the contingent rental will be the equivalent of 6% of the net profits.

The railroad was built entirely with the proceeds of bonds issued from time to time by the City of Cincinnati. Construction was started in 1873, at a time when the city was in great need of recovering commerce in the southern market territory that has been lost as a result of the Civil War.

Success Despite Difficulties

Many difficulties were encountered, and construction costs and interest rates proved to be much higher than expected. The city went ahead with its plans, however, and the first train passed over the road in 1877. In 1926, the amount of the early deficits and the interest during construction were completely wiped out. Before the final bond maturities in 1965, the earnings not only will have met the interest burden, but will also have paid off all the bonds and left the city with the ownership of a splendid road and a surplus.

The operating company is required by the lease to pay all costs of maintenance and also to replace bridges and equipment. It has built much additional trackage and made many improvements, all of which become the property of the city and which have increased the value of the railway many times over its construction cost.

As with New Orleans, it may be that Cincinnati's long, successful history of railroad interest helped to stimulate and to make possible the construction of the Union Terminal, finished in 1933. This unified, centralized passenger terminal, with the surrounding yards and facilities, is an outstanding example of planning for railroad utility and beauty. Seven railroads, which had formerly used five separate passenger terminals, cooperated with the city by making the building, its spacious plaza and approaches, one of the finest in the United States.

New Freight Terminal Proposed

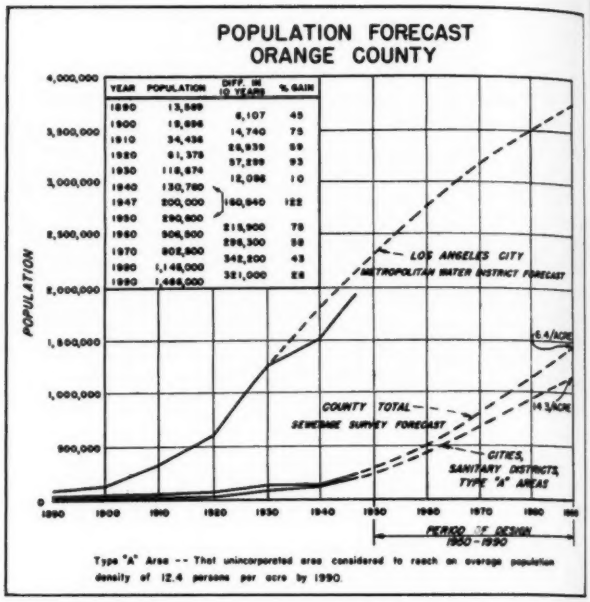
A recent report of the Cincinnati Planning Commission now proposes a plan for freight-terminal arrangements. Such a project, although costing much less than the passenger terminal, would have many advantages for the city, such as improving operations, lowering their cost, and eliminating the need for many grade-crossing projects. The study points out that no other element in a metropolitan master plan is more influential in shaping the basic land use pattern than the railroads.

Cincinnati's railroad development has undoubtedly helped to maintain it as a growing and important metropolis. Other municipalities would do well to recognize the economic importance of railroads in the life of a city and to make more concentrated efforts for railroad and terminal improvements.

ORANGE COUNTY

Sewerage Survey Develops A 40-Year Regional Plan

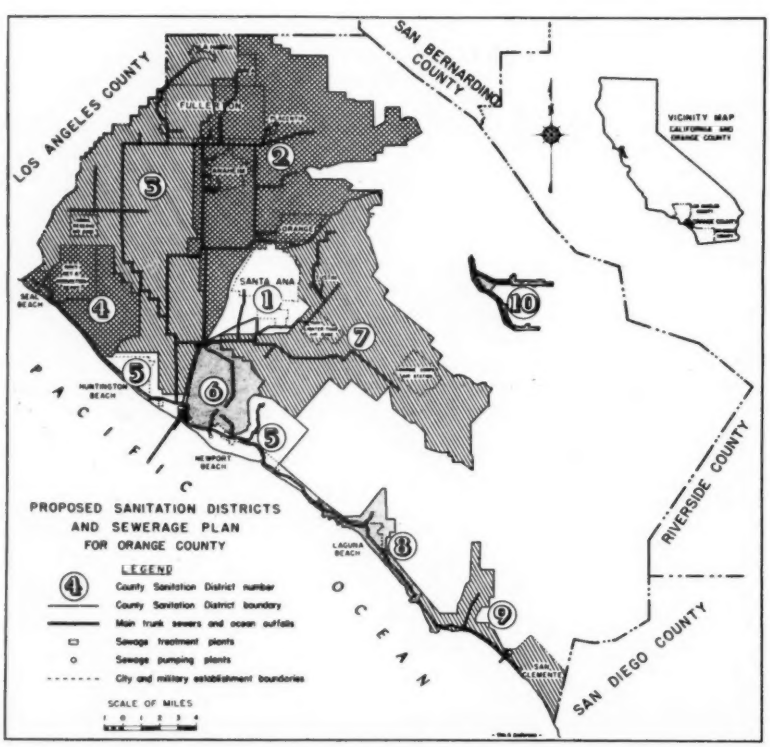
By VINTON W. BACON
Office Engineer
Orange County Sewerage Survey
and
CHARLES H. DIGGS
Planning Director
Orange County, California


POPULATION FORECAST
ORANGE COUNTY
POPULATION
LOS ANGELES CITY METROPOLITAN WATER DISTRICT FORECAST
COUNTY TOTAL SEWERAGE SURVEY FORECAST
CITIES, SANITARY DISTRICTS, TYPE "A" AREAS
6.4/ACRE
14.3/ACRE
PERIOD OF DESIGN 1950-1990
Type "A" Area -- That unincorporated area considered to reach an average population density of 12.4 persons per acre by 1990.

YEAR	POPULATION	DIFF. IN 10 YEARS	% GAIN
1890	13,589	6,107	45
1900	19,696	14,740	75
1910	34,436	26,939	59
1920	61,375	57,299	93
1930	118,674	12,086	10
1940	130,760	160,840	122
1947	200,000		
1950	290,600	215,900	75
1960	506,500	296,300	58
1970	802,800	342,200	43
1980	1,145,000	321,000	28
1990	1,466,000		

The growth of Orange County will be influenced greatly by Los Angeles' development, as this population graph shows.

ORANGE COUNTY, Calif., lying along the Pacific Coast between Los Angeles and San Diego Counties, has completed a sewerage survey and report which recommends a long-range regional plan for the financing and construction of trunk sewers, sewage-treatment plants, and land and ocean outfalls. The recommended projects and the construction schedules have been planned to serve the present needs of the somewhat widely separated cities and unincorporated communities. It anticipates the population and industrial growth for the 40-year period, 1950 to 1990.



Ten sewer districts have been recommended for Orange County.

Orange County has two major industries — agriculture and oil. Per acre, Orange County is the richest agricultural county in the United States. On the basis of total value of agricultural products, it ranks second. Principal industries serving agriculturists in Orange and other Southern California counties include the largest fruit and vegetable cannery on the West Coast, a large sugar-beet refinery, and numerous citrus-juicing and citrus by-products plants. Protection of the vast, but diminishing, underground water supply against pollution is of paramount importance to the agricultural interests, which rely heavily upon this reservoir as a source of irrigation water.

The seven developed oil fields make Orange County the fourth largest producer of crude petroleum in California. These fields create a waste disposal problem with the brine that is separated from the crude.

Although the beaches can hardly be classified as a major industry, nevertheless the 42 miles of coast line and beaches, together with the climate of Southern California, constitute a valuable physical asset.

At present, Orange County is served by 17 separate collecting and trunk-sewer systems and 15 sewage-treatment plants. Almost all the sewage-treat-

Six-foot floats like those shown here were used to determine the characteristics of ocean currents.

ment plants and ocean outfalls, and also many of the trunk sewers, are at capacity or overloaded, and are urgently in need of expansion, repair, or replacement. Some of these systems serve communities with a population of less than 5,000, which would be hard pressed to bear the financial load of providing adequate sewage treatment and disposal on an individual basis, instead of on a regional or cooperative-enterprise basis.

Two of the sewerage systems discharge raw sewage and four discharge treated effluent into the Pacific Ocean through outfalls varying in length from 600 to 4,000 feet. Five of these ocean outfalls have developed leaks near the on-shore end, and unless repaired or replaced, there is danger of contamination and quarantine of bathing waters. The 11 sewerage systems which do not employ ocean-disposal discharge their treated effluent into lagoons or dry washes and river beds.

In addition, there are 12 rapidly expanding unincorporated communities, one exceeding 13,000 population, relying upon individual cesspools and septic tanks.

Objectives and Scope of Survey

Recognition of these factors prompted the Associated Chambers of Commerce and the county and state health departments to take action. Jointly they requested the Board of Supervisors of Orange County to authorize a countrywide survey and study which would develop a plan for future sewering of the area. In June 1946, the Board appropriated $50,000 for the survey and retained three consulting engineers to direct the work and to recommend a suitable plan. The Survey Report and Recommendations were submitted by the consulting engineers on July 1, 1947, 11½ months after the survey began. They covered the points discussed below.

Los Angeles County has been the focus of development in the southern part of the state. Consequently, it is logical that Orange County will grow at an accelerated rate as Los Angeles County approaches full development, since the two counties comprise the most desirable plainsland area of Southern California.

The population forecast curves show a predicted population of 1,446,000 in 1990 for Orange County, which would represent a seven-fold increase over the estimated 1947 population of 200,000. Corresponding average population densities within the 10 proposed sewerage districts would be 6.2 persons per acre in 1990; 0.8 persons per acre in 1947.

Results of studies from 21 of the 29 major industries show that the total 1947 seasonal organic load reaches a peak in August, with a population equivalent of 850,000, or over four times the total county population. On the basis of the volume, the seasonal peak has a population equivalent of 100,000. This high seasonal load probably will decline as the area urbanizes.

Ocean Currents

Sewage, when discharged into salt water, rises and forms a thin surface layer, which then tends to diffuse slowly in the ocean waters. During mixing the entire stratum will be transported by the surface currents. Therefore, the pricipal problem involved was a determination of the velocity and direction of the surface currents under all conditions of wind and tide for all seasons of the year.

The data assembled and conclusions reached in the ocean current studies may be briefly summarized as follows:

1. Except during times of storms and very unusual weather conditions, the surface current within the 3-mile zone has a strong on-shore component during the day, and an off-shore component at night.
2. Both the on-shore and the off-shore currents are stronger during the summer months, when the temperature variations are greatest.
3. If large volumes of sewage are discharged continuously during the summer, the point of discharge must be at least 15,000 feet off-shore and at a water-depth of approximately 120 feet, to prevent strong on-shore currents from carrying the sewage effluent into recreational waters.
4. Where small quantities of sewage are involved, it was demonstrated practical to reservoir the chlorinated treatment-plant effluent and discharge it 2,000 feet from shore between the night hours of 6 p.m. and 2 a.m. when the current is predominately off-shore.

The survey demonstrated that sewage reclaimed by the activated-sludge treatment process would cost an average of

A 90-degree V-notch weir at a citrus by-products plant measures the amount of waste coming from the plant.

$20.35 per acre foot delivered to the land (pumping and distribution system included), but that unsoftened Colorado River water is available to areas included within the Metropolitan Water District of Southern California at a cost of approximately $9 per acre foot (taxes included). Therefore, the report recommended that no attempt be made at this time to reclaim the water content of the sewage. In addition to the economic considerations of sewage reclamation, there is also the question of danger to citrus and other crops from boron in the sewage, believed to originate mostly from citrus packing plants. This boron cannot be removed by any known sewage-treatment process.

Recommended Projects

The survey recommended that 10 County Sanitation Districts be formed under the California County Sanitation District Act of 1923 and that the trunk sewers, pumping plants, sewage-treatment plants, and outfall sewers be constructed and extended as needed.

It was also recommended that Districts Nos. 1 to 8 inclusive be joined by contract in the ownership, operation, and maintenance of facilities which would be jointly used by two or more districts, such as the ocean outfall, sewage-treatment plant, and some of the trunk sewers. The single sewage-treatment plant would embody 1-hour plain subsidence, grease and skimmings removal, separate sludge digestion and drying, and power generation from sludge gas. Treated effluent would be discharged continuously through a 78-inch reinforced concrete ocean outfall, 15,000 feet long, and discharging at a depth of 120 feet. Trunk sewers serving these districts would vary in diameter from 8 inches to 90 inches.

Because of their remote location from the treatment plant and ocean outfall recommended for Districts Nos. 1 to 8, it was found more economical for District No. 9 and District No. 10 to build and operate sewerage systems to serve only their respective districts.

It was recommended that District No. 9 build a treatment plant near the center of the district which would provide 2-hour plain subsidence, grease and skimmings removal, separate sludge digestion and drying, and storage of the plant effluent in a closed reservoir for not less than 16 hours each day. The stored sewage would be discharged through a 33-inch reinforced concrete ocean outfall, 2,000 feet long, during the night only, between approximately 6 p.m. and 2 a.m., when the ocean current is predominantly off-shore. The treated sewage would be chlorinated during storage for odor control.

In District No. 10, the sewage-treatment plant would include an Imhoff tank, sludge-drying beds, and oxidation ponds or lagoons which would provide 40 days for retention and purification of the clarified sewage prior to its discharge into the Santiago Creek bed, from which it would percolate into the underground reservoir.

The estimated construction cost of the recommended project is $27,000,000, which would be spread over the next 40-year period, 1950-1990, as need for construction of the sewage works developed.

All the work done by the survey was under the direction of the Board of Consulting Engineers, consisting of A. M. Rawn, Chief Engineer and General Manager of the Los Angeles County Sanitation Districts, chairman; Charles Gilman Hyde, Professor Emeritus at the University of California in Berkeley, and Dean Franklin Thomas of the California Institute of Technology, Pasadena. The engineering staff consisted of Principal Assistant Engineer Ewald M. Lemcke, loaned to the survey on a part-time basis by the Orange County Joint Outfall Sewer Board, and Assistant Engineers Harvey F. Ludwig, John D. Parkhurst, Gordon W. Ludwig, and Vinton W. Bacon.

Municipalities Continue Non-Property Tax Adoptions

Admissions tax especially popular

CITIES continue to adopt special non-property taxes. One of the most recent developments is the adoption of tobacco, gasoline, and beer taxes by a county in Alabama and distribution of most of the proceeds back to cities in the county.

Taxes on admissions to theaters, sports events, and other forms of entertainment have been especially popular. More than 200 cities have adopted this tax during the past four years. Local cigarette taxes are in effect in about 60 cities, local gasoline taxes in 275 cities, and auto-license taxes in approximately 110 cities, according to a special study recently made by the International City Managers' Association of these four non-property taxes.

Admissions taxes constitute one of the best local non-property taxes that can be adopted, the Association points out. Eighty Ohio cities adopted this tax last fall when the state of Ohio abandoned the state admissions tax. The rate is almost uniformly 3%. Only Toledo and Norwood, among the 26 cities of more than 25,000, have not adopted the tax. When the State of Washington in 1943 repealed its tax on admissions and gave cities permission to levy such taxes, 65 cities, including all those over 10,000, adopted this tax. Among cities in other states adopting this tax are Chicago, Pittsburgh, and Richmond. It is a good tax for reaching non-residents and temporary elements in the resident population.

The cigarette tax, according to the Association's survey, raises from $1.50 up to $2.75 per capita per year on a 2-cent tax on a package of cigarettes. A half dozen cities also tax other tobacco products.

The gasoline tax ranges from ¼ cent to 2 cents per gallon. A 1-cent-per-gallon tax in St. Louis raised $1,300,000 in 1947. Recent adopters of the tax include Casper and Cheyenne, Wyo., and Jefferson County, Ala.

Local motor-vehicle-license taxes, which cities in 13 states are authorized to levy, vary from $1 to $20 for passenger cars and from about $3 to $100 for trucks. In some cities the tax applies to non-resident owners of motor vehicles who regularly use the city streets.

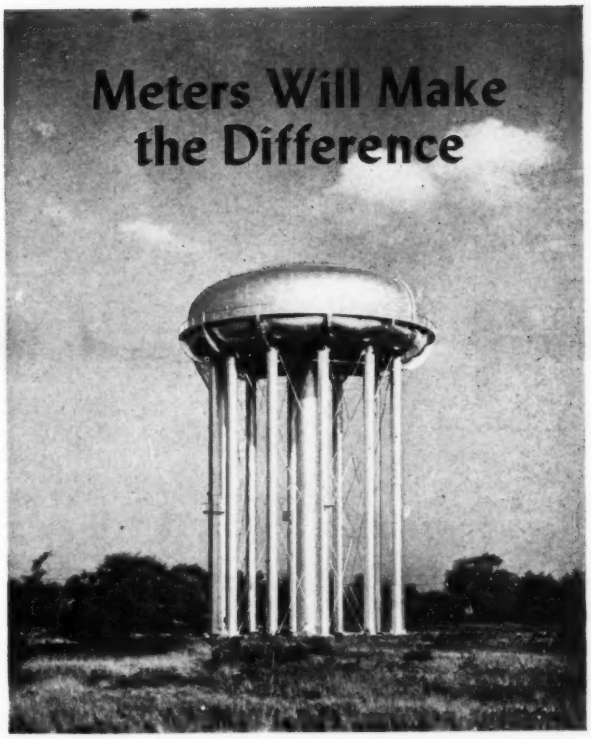
Jefferson County, Ala., last fall adopted gasoline and tobacco taxes which, together with a beer tax, will raise $2,725,000 this year. The two largest cities in the county, Bessemer and Birmingham, abandoned their local cigarette taxes when the county adopted this tax. But the county distributes 75% of the tobacco and beer taxes back to all the cities on the basis of population. The proceeds of the 1-cent gas tax are distributed to the cities on the basis of gasoline deliveries made in the cities.

A special report discussing in detail the extent to which each of these four taxes has been adopted and how they are administered has been issued recently by the International City Managers' Association and sent to the officials of cities which subscribe to its Management Information Service. The report discusses the tax base, the amount of revenue, the method of collection and enforcement, exemptions, the cost of administration, and appraisal of each tax.

XUM

Meters Will Make the Difference

If Port Huron, Mich., includes 100% metering program in its water improvement project, it can cut elevated storage requirements by a million gallons.



This million-gallon elevated storage tank is located in the southern portion of Port Huron near the St. Clair river.

THERE will be a million gallons of water less that have to be stored in overhead tanks at Port Huron, Mich., if officials decide to install meters throughout the entire system as part of their water improvement program. Two new elevated tanks have gone up in this city as a result of such a program. One holds 1,000,000 gallons, and the other, 500,000. The meters, if installed, will save the need for erecting a third tank when the filter plant is built.

Port Huron obtains its water from the St. Clair River near Lake Huron. In the past water has been treated by chlorination only. However, a study made by Ayres, Lewis, Norris and May, consulting engineers of Ann Arbor, Mich., recommended that the treatment be increased by filtration and that the water be distributed on a metered basis. The engineers further advised that the pumping station be electrified and that added storage requirements be met.

The study of storage requirements showed that meters would be economical:

	Without Meters	*With Meters*
Elevated tanks	2.5 mg	1.5 mg
Ground storage	2.5 mg	2.0 mg
Total	5.0 mg	3.5 mg

On the basis of these findings the city installed its two new Chicago Bridge and Iron all-welded water towers, and will key their operation with a new electrified pumping station located on the St. Clair River. The proposed pumping station will have a maximum of security from the standpoint of electric service. Duplicate lines can be run from a nearby substation of the Detroit Edison Company. The pumps will be capable of keeping these tanks full until the beginning of the afternoon peak. There will always be a sufficient reserve in storage to meet any short-time outages in the power supply.

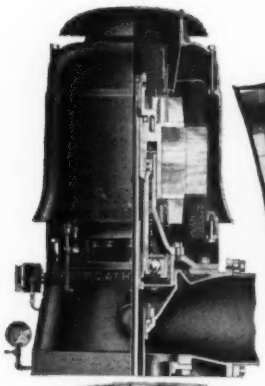
A half-million-gallon tank equalizes pressure in north Port Huron.

In addition to making it possible to electrify the pumping station at considerable savings in operating cost, the locations of these tanks are such as to maintain pressures at both the northern and southerly limits of the city, and to avoid additional transmission mains with the present loads. The cost of electric power for the pumping station will run about 1 cent per kwh.

The Port Huron distribution system consists of about 450,000 feet of mains varying in size from 2 to 6 inches. In addition, there are 187,000 feet of transmission mains running from 8 to 30 inches. Prior to this new improvement the city had no elevated storage and relied on direct pumping for water distribution.

In the past the daily use of water averaged 10 mgd, with maximum daily peaks of 17 mgd and maximum hourly rates of 25 mgd. At present the system has only 650 of the 10,000 services metered, with but few of these on private dwellings. As a result, the average use runs to the fat total of about 280 gallons per capita per day.

To keep water pure...



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As shown in the inset at left, full thought has been given the small amount of lubricant passing between the line shaft and pump bowl main bearing. Any lubricant passing through this bearing escapes through the relief port cored laterally to the outside of the discharge nozzle. (See dotted line.) The oil, being of lighter weight than water, quickly rises to the top of the water surface surrounding the *outside* of the eduction pipe—above and beyond the reach of the formation water entering the suction strainer below the bowl assembly.

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The "General Residence District"

Waukesha's new zoning ordinance sets minimum residence standards instead of segregating apartments

By EDWARD C. MOORE
and
MAYNARD W. MEYER

IN OCTOBER 1947 the City of Waukesha, Wis., adopted a new zoning ordinance, replacing one that had been in effect since 1923. In this ordinance a somewhat new approach is used for the residential areas, particularly in the establishment of, and the regulations for, what is called the "General Residence District."

For a number of years studies had been made by the City Plan Commission leading towards the eventual revision of what had become a rather obsolete and cumbersome tool, the old zoning ordinance. At the beginning of 1947, however, when the actual drawing of the new ordinance was undertaken, there were several special problems in residential zoning facing the city. As is generally the case with old cities, Waukesha has many large old houses, widely scattered, often in still stable neighborhoods, but because of their size, no longer suitable for single-family or even, in many cases, two-family occupancy. The pressure of the housing shortage brought many requests for conversion. There was also, due largely to high building costs, considerable interest in the construction of four-family houses with the aim of economies not possible in single or two-family houses. There were also proposals for developments of the garden apartment type. None of these was provided for among the uses permitted in residence districts under the old ordinance.

Separate Apartment Districts Thought Unwise

It was felt that the demand for these, and possibly other housing types, was just and would probably continue. It was also felt that it would not be proper to segregate them into small multi-family districts. First, because, if carefully controlled, they would not be incompatible with other dwelling types but would, on the contrary, serve to provide needed variety. Second, because their requirements for quiet and uncongested surroundings are the same as for any other homes. And third, because it was almost impossible to point out any area of reasonable size of which it could be said. "This is suitable for apartment development and that is not." As a result, the residential portions of the city were finally divided into three districts:

(a) The Agricultural District, largely unplatted lands not yet ripe for development or not yet reached by sewer or water facilities,

(b) The Single-Family Residence District, and

(c) The General Residence District, in which any type of residential building would be permitted.

It became apparent at once that if all types of residential buildings were permitted to mingle side by side in one district, the usual type of height and area regulations would not suffice. They would either allow too high a density and the overshadowing of small buildings by taller ones on the one hand, or they would require open spaces large enough for the larger buildings which would be unreasonable for the smaller ones. In considering the regulations that were finally adopted, great weight was given to the minimum standards outlined by the Committee on the Hygiene of Housing of the American Public Health Association in its *Standards for Healthful Housing*, a preliminary draft of which was used in drawing up the ordinance. The regulations were then drawn so that considerable flexibility existed in answering the familiar zoning questions:

What may be built?
How large an area is required?
How may the building be located?
What special open spaces must be provided?

These four questions are covered by four separate sections of the ordinance, operating to a certain extent independently, so that in any given case one out of several different provisions would determine the maximum intensity to which a particular piece of land might be used.

Four Sections of the Ordinance

The first of these sections, Section V, enumerates the permitted uses. These include dwellings for any number of families whether in detached, two-family, row or apartment houses, and also other uses customary in residential districts such as churches, schools and the like.

The second of the sections, devoted to minimum lot areas for General Residence districts, is based on the type and the height of the building, as follows:

Section VI. *Lot Area Regulations.* The following regulations shall govern the minimum lot area, minimum lot width, and the maximum lot coverage that shall be allowed for any building or structure:

The minimum area which shall be provided on any lot used for residence purposes, for each family unit occupying such lot shall be as follows:

Type of Building	*Square Feet per Family*
Single-family house	6,000
Two-family house	3,750
Row house, one-story	2,500
Row house, two-story	2,000
Apartment house, one-story	2,500
Apartment house, two-story	2,000
Apartment house, three or more stories	1,200

The minimum lot width which shall be required for any lot used for residence purposes shall be as follows:

Single-family, two-family or apartment house	50 feet
Row house, one-story	25 feet
Row house, two-story	20 feet

The maximum percentage of the required lot area that may be covered by a dwelling shall be 25% and by an accessory building 15%.

The third section adopted governs the placement of buildings upon the lot. However, study is at present being given to increasing the separation of tall buildings from their lot lines. This section reads:

Section VII. *Placement Regulations.* The following regulations shall govern the placement on the lot of any building or structure in an agricultural or residential district and of residential buildings in any other district in which they are permitted.

A. *Main Buildings.* No part of any main building shall be located closer, either to any property line or to any other main building on the same lot therewith, than a distance equal to the minimum dimension shown as follows, or equal to the percentage of the height of that part above the finished grade of such property line or of such other main building shown as follows:

	% of Bldg. Height	*Min. Distance*
to the front property line	50%	
to the side property line	50%	5 ft.
to the rear property line	100%	20 ft.
to other main building	100%	15 ft.

B. *Accessory Buildings.* No part of

It's like buying a packaged pipeline!

Installing a Dresser-Coupled steel line is so simple that it's almost like taking a pipeline out of a package. You use plain-end steel pipe just as it comes from the mill—assemble it with Couplings just as they come from the factory—ready-made, fully tested, all set to go.

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Even in cramped quarters, Dresser Style 38 Couplings make permanently tight, flexible joints every time.

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Chicago, Ill.	Harrisburg, Pa.	New York, N. Y.	Syracuse, N. Y.
Cleveland, Ohio	Kansas City, Mo.	Philadelphia, Pa.	Yakima, Wash.

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any accessory building shall be located closer than 3 feet from any side or rear property line, nor closer than the front line of any main building to the front property line, unless attached and a part of such main building.

The fourth of these regulatory sections governs open spaces that must be provided in addition to the above.

Section VIII. *Required Open Spaces.*

1. *Set-back Lines.* All buildings or structures, except for free standing walls and fences, shall be required to conform to the following set-back lines:

A. All buildings shall be set back at least 50 feet from the ordinary high-water mark of the Fox River.

B. All buildings in . . . general residence districts . . . shall be set back 25 feet from the street line as established on the "Official Map of the City of Waukesha," or, where such street line has not been so established, then from the existing street line.

2. *Corner Clearance.* In any residence district on any corner lot there shall be no material obstruction to vision between a height of 3 feet and a height of 10 feet above the grade of either street within the triangle formed by the street lines and a line connecting such street lines 40 feet from their intersection.

The fact that these sections operate independently prevents what would otherwise be excessive crowding. While the Area Regulations allow a high density with tall buildings, the Placement Regulations forbid such a tall building except on a large piece of land. It is hoped that by means of these rules the redevelopment of the older parts of the city and the new development in fresh areas suitable to higher densities can go forward with variety and order. The new can then be built next to the old and the old given renewed usefulness without permitting either to encroach on the other.

Should Church Property Be Taxed?

THE proposal to tax church property was debated in *Look* magazine by Dr. Charles Clayton Morrison of *Christian Century* fame, in the affirmative, and Joseph V. McKee, counsel for the Roman Catholic Archdiocese of New York, in the negative. As summarized in *Information Service* of the Federal Council of Churches of Christ in America, Dr. Morrison maintained that the essence of the separation of church and state in the Constitution is avoidance of any institutional connection. In the provision that Congress "shall make no law respecting the establishment of religion," the key word, he holds, is "respecting," for it is equivalent to "pertaining to, in view of, or tending toward, such an establishment." Exemption of church property is in effect "a subsidy paid by the state to the churches." It also infranges the guarantee of "free exercise" of religion, since that implies the "right *not* to support any religion at all." (While the discussion is in terms of the First Amendment, which limited Congress only, it is now agreed that the Fourteenth Amendment extends the same restriction to the states, however it is interpreted.)

The argument stresses the vast accumulation of church property; the unwholesomeness, from the point of view of religion, of dependence on a subsidy; the hazard to the state of such an arrangement; and the artificial stimulus given by tax exemption to "an unconscionable multiplication of churches."

Mr. McKee, defending the negative, argues that the United States is a religious nation and "has long recognized the need to encourage, not handicap, those instrumentalities which foster and inculcate the principles of religion, mercy and charity." He also points out that the church teaches ethics as well as religion and maintains that it is a great public asset "in the field of public order." Also, its hospitals and homes render a service which, if the burden of them should become too heavy, the state would have to take over, and it is not so well qualified for works of "charity and mercy."

Furthermore, Mr. McKee contends that only about 5% of tax-exempt property is private property, and "only a very small part" of this is church property. The latter point seems to the editors of *Information Service* to be the most crucial one, though Mr. McKee does not press it directly. If church property is exempt not merely as *church property* but as coming under the prevailing three-fold category to which he incidentally refers, of "charitable, religious and educational institutions," the ground of the entire argument might, it would seem, be shifted. Here the policy is made by the states, not by the federal government.

I Only Want to Belong!

Meditation of the Minorities

By NELLIE W. HAMM

THEY asked me what it is that I want of America. "Must you always raise an issue or present a problem?" they asked. "What is it you want?"

What do I want? It is such a little thing—a child could ask no less. Perchance just to feel that I, too, may sit at the table of America and share its bounty as another member of the human family.

Let my shoulders, too, turn the wheels of industry. At dusk let me watch the twinkling lights of a great city come up, feel its gentle pulse beat, and know that perhaps my hand stimulated its heart.

On a crowded bus or shining train, that by my sweat has come rolling off the assembly line, may I have a smile instead of a frown from my fellow traveler.

To enter a shop, market or merchandise mart, that by my labored breath was erected to the sky, and be greeted with a pleasant, "May I help you, please?"—thus knowing that my face and my money are welcome.

I want to be a part of the living arts—to lift my voice in the community chorus, to dance a cotillion of friendship, to compose a symphony of kindred minds, to paint a scene of mutual sorrows and laughter.

Don't let them consider me an oddity, a blight on the family of races, the "block bad boy" carrying a chip of defense on my shoulder. I want no "fight," no "issue," no "problem." Dear God, help them see—*I want only to belong!*

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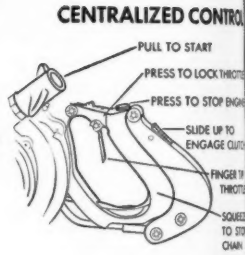
ONE-MAN CHAIN SAW
with Mercury Gasoline Engine

SERVICE PROVEN . . .
A time and money saver
Use it for light felling and bucking, for limbing, and construction timber cutting.



Here's a ONE-MAN Chain Saw with everything you could ask for. It has extra power and cutting speed. It's compact, well-balanced, light in weight. It's safe and easy to handle, simple to operate . . . Delivers full power with saw held at any angle . . . Will stand up long in hard, steady work . . . service proven. And it bears the Disston name . . . carries the Disston guarantee . . . your assurance of top quality in every detail

RUGGEDLY BUILT FOR TROUBLE-FREE SERVICE

Use the Disston ONE-MAN Chain Saw on any kind of cutting within its 18" capacity. You'll say, as so many others are saying, "It's a real engineering achievement." Examine its special features. 2-cycle, 3½ h.p. (4000 r.p.m.), air-cooled engine with anti-friction bearings on all rotating parts . . . each precision built to within very close tolerances. Fuel meter gives automatic fuel feed and also acts as engine speed governor. Built-in automatic chain lubricator. Crankshaft type magneto, doubly protected against dirt and moisture.

Transmission gears run on anti-friction bearings. Clutch is positive, quick acting, manually controlled. Cutting chain of Disston Steel, fully interlocked. Replacable air cleaner. Magnapul starter. All these and many others combine to give you a ONE-MAN Chain Saw you can count on for dependable performance under all operating conditions.

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Notching for felling. Note perfect balance because of design and position of handle.

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Diesel Electric Units Floated on Lava

Idaho Falls, Idaho, builds an earthquake-resistant foundation and bedplate for diesel-electric engines previously damaged by an earth tremor

THE City of Idaho Falls, Idaho, owns an electric system powered by three hydro plants along 10 miles of Snake River, two of them within city limits. Within the city there is also a diesel-electric plant, originally intended more as an auxiliary, but soon used constantly as the main source of supply. Water shortages occur in this region and in Spring when the river is high, the water is laden with trash that precludes the use of the hydros.

In addition, the soil is volcanic and hence unstable. In 1946 an earth tremor in the lava formation caused a split in the foundation of a 1125-kva diesel-electric unit that extended up through the middle, splitting also the engine bedplate and frame. The break, as much as 6 inches wide, was too serious for repair.

A proposal was requested from A. G. Schoonmaker and Company, New York, and accepted by Mayor E. W. Fanning on February 20, 1947. The proposal involved two 1250-kva units, and quick delivery was urgently requested by the city. George Holmberg, the company's engineer, found at the site that a relay out of the plant was necessary for installation of auxiliaries as well as the generating units.

The foundation situation, of course, called for special attention. The foundation was rebuilt, using enough of the old to save 30 to 40 cubic yards of new concrete. Instead of installing the engines and generators directly on the concrete, the engine and generator of each unit were mounted together on a common sub-base designed to furnish a self-supporting unit. Normally such a diesel set would be fastened to the old foundation by twenty-six 1-inch conventional bolts. The new set is held only by twelve ¾-inch bolts acting more as shear pins. Should this foundation be split by an earth shock, the worst damage will be shearing of the foundation, while the bolts and base will stay together and keep in place.

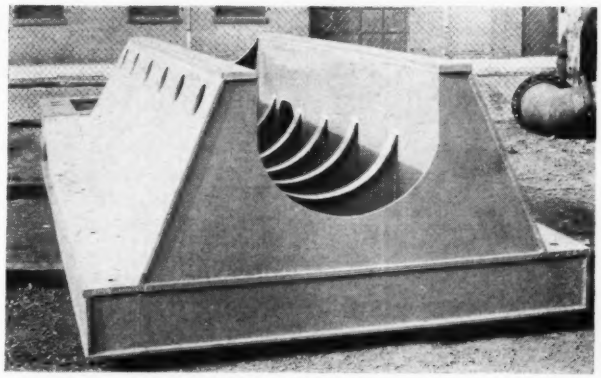
The plant as laid out by Mr. Holmberg has the two new generators occupying the same space formerly occupied by the fractured unit. The auxiliaries, including coolers, filters, day tanks, and sump tanks, were fitted compactly into a space 10 by 14 feet in the basement in front of the engines. This equipment is readily accessible.

To facilitate operation and achieve centralized control, the engines were furnished as a "pair," the alternators operating in opposite directions, and thus placing the controls inboard on the center aisle at the front end of the engines.

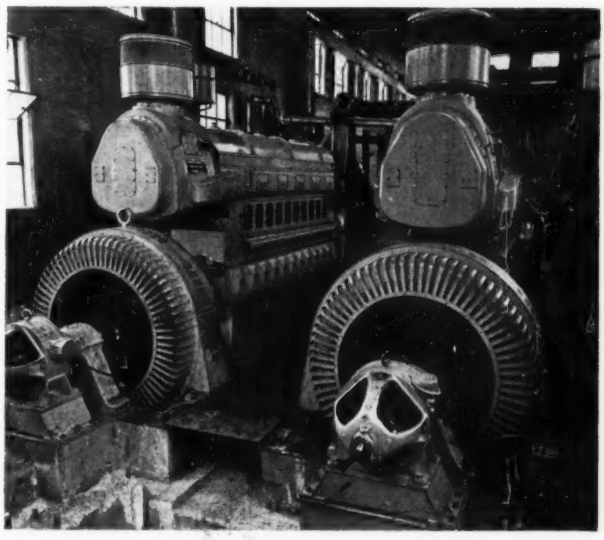
It has been the practice of M. P. Goudy, Superintendent of the Electric Light Department, to take advantage of diesel-drive efficiency to run these two new generators at or near unity power factor. Such a power factor, of course, means that all the power goes into work, which means top revenue to the plant. A power factor of say 80%, on the other hand, means that 20% of production is wasted as mere heat generated. This waste, or "reactive kva," unavoidable in the total system is absorbed by the hydroelectric units.

When the river is high enough, cooling water for the diesels is obtained there. When full of trash or at low stage, the cooling water is supplied by the city water system—necessitating pressure reduction before circulating the water through the heat exchangers.

In four months the job was completed. Two of these months were consumed waiting for the steel for the two sub-bases.

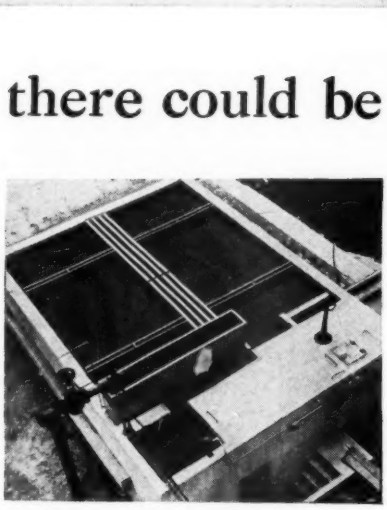


Here is the type of bedplate that supports the new engines. It is strong enough to hold together in the event that the foundation again shifts and thus endangers the engines.



These are the two big diesel engines that went to Idaho Falls when shifting foundations destroyed the old engines.

. . . there could be such a *difference* in water!"



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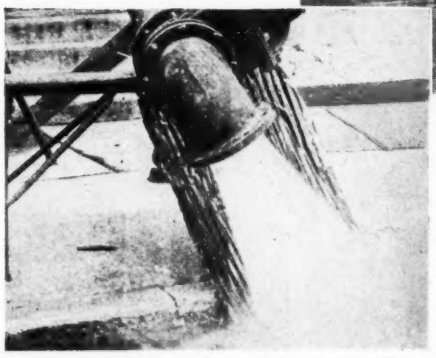
Wauwatosa rehabilitates its wells and increases their yields to get

Thirty Percent More From The Same Wells



▲ **Acid trucks gather at the Blanchard St. Station, Well No. 6.**

◀ **The well showed a husky production rate after getting the acid treatment.**

Well No. 8 during construction.

WHILE Milwaukee and most of the suburbs obtain their water from Lake Michigan, Wauwatosa uses deep wells. However, the 1944 loss in groundwater capacity indicated that all was not well with this supply. In order to correct these difficulties, the city embarked on a rehabilitation program that has produced an over-all increase in yield of 30%. In certain individual wells the increase went as high as 50 to 60%.

The decision to rehabilitate the wells in this manner emanated from a committee of qualified, civic-minded engineers, all appointed by the Mayor and living in the City of Wauwatosa. Mayor Knuese's instructions to this committee were to study ways and means of supplying present needs, and to study underground water supply to determine its adequacy for the future.

The Wauwatosa system consists of six active wells. Depths vary from 1,600 to 1,900 feet below the pump bases. Two of the wells have overhead storage tanks with a total capacity of 1,500,000 gallons. Three others have ground-level storage tanks with a total capacity of 2,720,000 gallons. All pumps are electrically driven but are connected to two different sources of power, so that the entire electric system would have to go out before complete service would be cut off. The overhead tanks would carry the city for about a day during the winter months and for several hours during the summer season. Up to the present time 10 minutes has been the longest electrical outage.

The committee found four causes for lower yield from the wells:

1. Lowered static level
2. Lowered yield of wells due to incrustation
3. Insufficient depth of pump settings
4. Inadequate equipment for the changed conditions

The distribution system was good. The problem was simply to get more water.

The groundwater records indicate that the level dropped about 130 feet from 1931 to 1944. One malting concern in the country was reported to be pumping more water than the city of Wauwatosa. Before industry discovered the desirable qualities of well water, the level used to recover during the winter months. The committee felt that underground water should be declared a public utility and regulated by the state.

The state, at the request of Mayor Knuese, subsequently passed a law, patterned after the New York law, requiring a license for every well larger than 100,000 gallons a day. It also limits the

your drainage dollar can be

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Costs are high and budgets won't stretch; yet you may be pleasantly surprised to see how far you can make those dollars go with Armco Drainage Products. At the same time you can stick to your determination of using the very best materials in the interest of public safety and economy.

Many cities have found ARMCO Corrugated Metal Products an especially wise choice when faced with the problem of building sewers, culverts, stream enclosures, bridges and other drainage structures at reasonable cost. This is why:

All ARMCO Corrugated Metal Structures have a high strength to weight ratio. Transportation costs are low. They are easily handled and installed by unskilled workmen. Less time is needed to finish the job. Labor costs are low.

Material costs are low because you choose exactly what you need in a wide range of sizes from 6-inch round pipe to a 24-foot MULTI-PLATE Arch. For severe corrosion there is ASBESTOS-BONDED Pipe, while a PAVED-INVERT will guard against erosion. And either standard Corrugated PIPE-ARCH or MULTI-PLATE PIPE-ARCH is just the thing for limited headroom.

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use of private wells if it interferes with public supplies. (See "Trend in Control of Ground Water," THE AMERICAN CITY, April 1946.)

Supply Lacking in Summer

The first point evident in the study of the data furnished was that the water supply was entirely adequate for the 2,000,000 gallons required daily for the fall, winter, and spring months. However, the 6,500,000-gallon peak load strained the city supply and caused low pressure in the high points of the city. Some members felt that inasmuch as the city had to maintain capacity of about three times the normal demand for a short summer peak, the rates should reflect this condition by charging extra for peak use. This suggestion, however, was voted down as impractical.

The study also showed that the water used during the winter months had crept up gradually from about 1,500,000 gallons a day in 1935 to slightly under 2,000,000 gallons when the studies were made. However, the summer requirements increased from 4,600,000 in 1935 to more than the maximum pump capacity of 6,600,000 and necessitated the use of the overhead storage tanks. In 1947 the demand and supply increased to 7,500,000.

Seven Recommendations

After studying the data furnished by both the City Engineer and the State of Wisconsin on static levels, the engineers recommended the following:

1. Lower all pumps to 440 feet below datum. Pumps to be reconditioned or new pumps to be bought.
2. Install a new well in the northeast section of the city.
3. Acidize well No. 6.
4. Continue restrictions on summer lawn sprinkling, because of huge demand over normal water use.
5. Study possibilities of a supplementary source.
6. Recommend a state law declaring underground water a public utility to be regulated by the state.
7. Determine adequate rates in order that equipment could be replaced from water revenues.

Yields Boosted

As City Engineer Henry Wildschut pointed out to the Committee, blasting a well is an old method of restoring capacity. Wauwatosa's water is hard, and in time incrustation takes place. Acidizing is an old method in oil fields, but comparatively new for water wells. The Committee recommended acidizing, despite its relatively recent use in water supply, because of its less violent action and its ability to get at the real root of the trouble. Acidizing was first tried in June 1944 at one well with an increase from 1,200 gpm to better than 1,450, or a boost in capacity of 20%. Acidizing has the advantage that the pump need not be pulled.

At another pumping station 15,000 gallons and 5 tons of stabilizers and intensifiers were poured into a well in 20 minutes. The discharge piping has been removed and a connection made so the acid could be pumped into the street. The acid in this case was left in one and a half hours. Pumping after treatment lasted from 3 p.m. to 1 a.m. Fire hoses diluted the acid in the street to prevent its eating the pavement.

All the recommendations have not been carried out. Equipment shortages slowed the pump lowering since the pumps required larger motors.

Because all wells are needed to meet the summer peak, water would have to be cut if there were any major equipment breakdowns. For that reason, the engineers recommended a new well for the northeast corner of the city, where low pressure has been experienced. A 19-inch well, 1,750 feet deep, the largest in Wisconsin, has been drilled and will be ready for service next summer.

Because Wauwatosa is primarily residential, the peak summer demand for water is about four times that of the other seasons. Because of this, sprinkling restrictions are necessary. People with odd-numbered houses sprinkled on odd-numbered days, and those with even numbers on even days.

A summary of work on the wells shows a 30% over-all increase in capacity between 1945 and 1947. Certain of the wells increased by more than 60%. The water-department records indicate that 50% more water was pumped in the past season than in 1944.

Since many Wisconsin communities depend on wells for their water, the United States, in co-operation with the state, has been studying water levels. Spot checks have been made in abandoned wells in various parts of the state. This work has expanded considerably, but material shortages of one kind or another have delayed the work to a certain extent.

Mayor Knuese's program of study by a committee of professional engineers and legislative action to conserve underground water supplies has paid off with adequate water for Wauwatosa. At this time it appears that another source of supply will not be necessary.

Wenham Gets Its Water System

AFTER nearly 30 years of existence, the Board of Water Commissioners in Wenham, Mass., finally acquired a water works. This municipal improvement became a reality recently when the town (population, 1,000) installed 10 wells, an elevated tank, and an asbestos-cement pipe distribution system.

The water commission came into existence following a state legislative act passed in 1919 which gave the town authority to establish a public water system. With permission granted, the town selected a Board of Water Commissioners, but refused to authorize construction of a water system. Various boards that continued in office tried unsuccessfully to get this step put into effect, but without avail.

In 1940 L. C. Wiley, one of the commissioners, who also was a member of the Wenham Post-War Planning Commission, saw an announcement that the Federal Government would lend money at no interest for post-war planning. He got in touch with the FWA's Bureau of Municipal Planning Facilities, which approved a loan of $11,000 to prepare plans and specifications. This was not difficult, since the town had no bonded debt and a tax rate of $18 per thousand dollar valuation, as well as a large cash surplus.

The preparation of the plans seemed to be the most difficult hurdle to jump, because following their preparation the town appropriated $345,000 for the construction of a system.

The system as constructed consists of 10 driven wells about 500 feet from a lake. Each well is designed to produce 10 gallons per minute. The pumping station is automatic, being operated by a pressure switch. There are two centrifugal pumps of 100-gallons-per-minute capacity. A Pittsburgh-Des Moines welded-steel standpipe 120 feet high floats on the system, furnishing a reserve capacity of 500,000 gallons. This distribution system uses Johns-Manville asbestos-cement pipe with copper service pipe.

A vacuum system using two Nash Hytor vacuum pumps brings the water from the well field to the pumping station. One of these uses power supplied by a ¾-hp induction motor while the other uses a Wisconsin air-cooled single-cylinder gasoline motor. At the station two American Marsh two-stage centrifugal pumps of 100-gpm capacity each deliver the water to the distribution system. The pumps are identical, driven by 10-hp G-E Tri-clad induction motors, dual drive, and can be powered by a 4-cylinder Red Seal Continental gasoline motor in case a power failure puts the electric equipment out of service. A fully automatic Clark control board controls the pump motors.

Altitude Control Valves by Golden-Anderson faithfully maintain a 3" to 12" water level variation, and are designed to assure unfailing water control under all climatic conditions. A special needle valve adjustment permits proper valve speed to suit any operating requirements, while inherent water cushioning design minimizes surge and water hammer problems. These valves may be arranged with auxiliary equipment to perform a variety of water control services. Write for complete information today.

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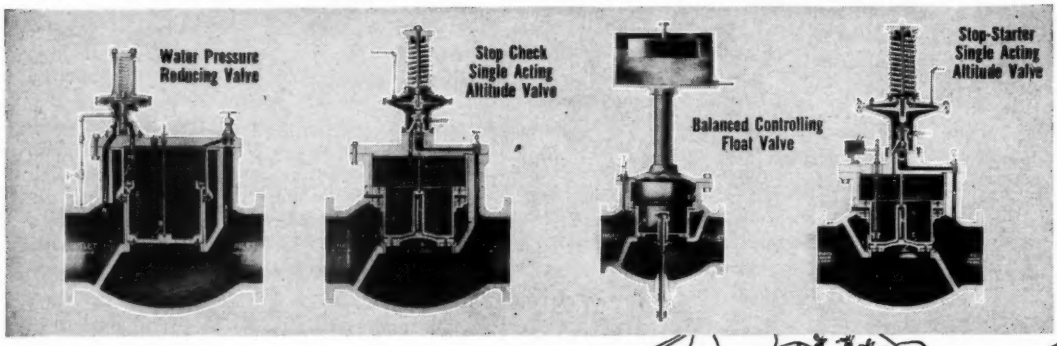
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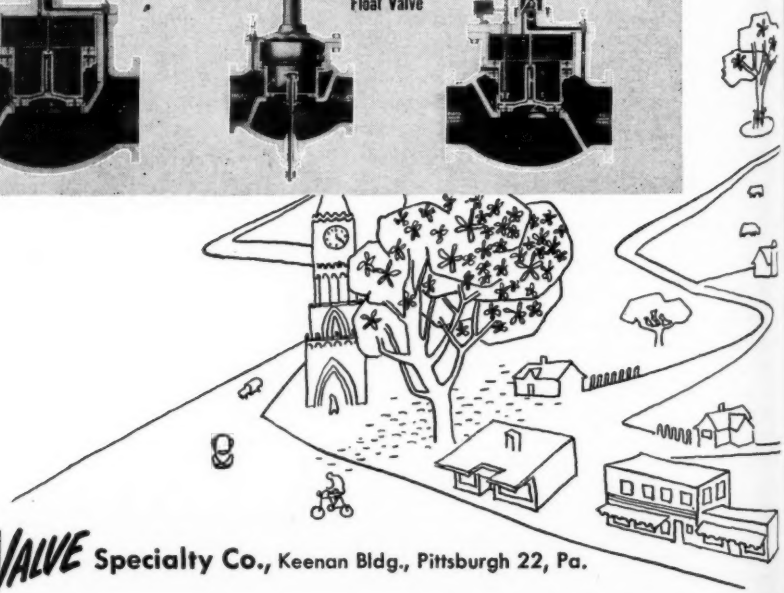

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Eight Public-Health Challenges

THE following eight challenges were made by the executive director of the National Health Council at its 1948 annual meeting in February. They are challenges to municipal officials no less than to National Health Council members. The Council, made up of leading national voluntary health agencies, has recently expanded its activities in the hope of uniting the forces of its members and their local branches more definitely to realize individual and community good health.

By BAILEY B. BURRITT *
Executive Director
National Health Council

Challenge No. 1.—No matter what our special interest in health may be—mental or social hygiene, heart disease, cancer, tuberculosis, or the general improvement of the health of the people, its fullest realization depends upon adequate public tax-supported health services. We need complete coverage of our entire population with health departments staffed by full-time, competent professional personnel. At present, some 40,000,000 of our population are without such services. . . . We must also recognize that much remains to be done to further the extent and improve the quality of existing services.

Challenge No. 2.—Extension and improvement of public-health services is retarded at present for lack of well-trained personnel. More adequate salaries, longer tenure of office, and greater support of training facilities for health personnel are essential if development of public-health services is to be made commensurate with the need. Equally important are improvement and development of personnel practices. . . .

Challenge No. 3.—To realize potentialities in public health more adequately, the attention of health authorities must be directed increasingly to individual persons. The well-being of an individual is directly related to the attention given to his health from the time of his conception until his death. Efforts to improve health in general, through mass approaches including sanitation measures, control and prevention of contagious disease, protection of milk and food supplies, etc., have accomplished outstanding results. But this is not enough. The individual person, through all age-periods, occupations, and environments, must be made the concern of professional public-health officials. . . .

Challenge No. 4.—To adequately maintain the health of all persons, health services must be both near at hand and sufficiently available. In many, if not in most, communities these requirements are not met. Extension and greater decentralization of services, to make them available in all areas, is important in meeting this need.

Challenge No. 5.—Utilization of all possible facilities in any community is essential to bringing preventive service to all persons. This requires greater integration of the hospital and public-health services of the community. It also requires a much closer tie between those services and private medical practice. Maximum preventive results cannot be secured unless and until the office of every private physician becomes a center for the prevention of disease and the maintenance of health. Another requirement is the integration of skills of professional services, such as nursing, dental services, etc.

Challenge No. 6.—We must develop citizen understanding of these and other health needs as they arise if we are to meet successfully the challenges which I have enumerated thus far. This understanding is fundamental, and the only way it can be secured is by democratic stimulation. A slow and admittedly difficult objective, it is attained by helping people in each community to see for themselves the health needs and potentialities of their respective areas, rather than by telling them what their problems are and how they can be met.

Challenge No. 7.—We have seen in the last two or three decades an ever-increasing number of local health councils, organized either as independent agencies or perhaps more frequently as integral parts of combined health and welfare councils. This trend has developed rapidly and has great potentialities. . . . Councils as yet are inadequately supported, and in some instances have been hindered through fear of ambitious agencies that they may retard rather than encourage the realization of the particular objectives of those agencies. Many councils have been handicapped also by a lack of adequate trained leadership.

In spite of these shortcomings, however, it has been demonstrated that the health council is an indispensable tool for securing, through the development of citizen understanding and participation, maximum results in public health. The challenge that now lies before the members of the national state and local health councils is the strengthening of the council movement as an effective means of rallying behind it those agencies and individuals thoughtfully interested in public health. . . .†

Challenge No. 8.—National health is national wealth. No other asset is as valuable to the people of the United States as their health. This was made evident in the last war. Good health, more than anything else, can now place us in a stronger position to maintain peace. Possessing it, we are able to increase production, maintain a high standard of living, and develop individual and family happiness and contentment. Realization of these aims, however, is dependent upon our ability to instil in every man, woman and child the desire to attain and maintain his own well-being.

† Information on the organization of local health councils is contained in the booklet, "Stepping Stones to a Health Council," available at 25 cents per copy from the National Health Council, 1790 Broadway, New York 10, N. Y.

PEOPLE who live in the home communities that ring Pittsburgh have found a new kind of freedom—made possible through the relighting of their city streets.

In Clairton, Aliquippa, Wilmerding, Avalon and other nearby towns traffic accidents have been reduced, night window shopping has picked up, and everywhere residents are commenting on how much more secure they feel after dark.

Typical of the quality of this new lighting is Franklin Avenue, Aliquippa, shown above. On this 42-foot wide street, classified by I.E.S. standards as a heavy traffic artery, 6000-lumen lights have been replaced with 10,000-lumens, mounting heights increased from 15 to 25 feet.

Typical of the reduction in traffic accidents is Miller Avenue, Clairton, where police officials reported a 25 percent improvement after the new lighting was installed.

Duquesne Light Company, the farsighted utility whose cooperation with municipal officials has made these improvements possible, is actively engaged in extending the benefits of good street lighting to additional areas—hopes soon to help make the entire Pittsburgh area a model of after dark safety.

THE WHOLE STORY

If you would like additional details, before and after photos, and ideas you can use to promote better street lighting in your community, write for your copy of "Improved Street Lighting Around Pittsburgh."

The Street and Traffic Safety Lighting Bureau, NEMA, 155 East 44th St., New York 17, N. Y.

XUM

Zoning and Planning Notes

Edited by NORMAN WILLIAMS, JR.
With the assistance of Frank B. Williams and Edward M. Bassett

Funeral Parlors—Zoning

ILLINOIS. *City of Sprinfield* v. *Vancil*, 76 North Eastern (2d) 471 (Illinois Supreme Court, November 20, 1947, modified on denial of rehearing, January 15, 1948).

A "high-class" residential district established in an "A' residence zone in Springfield changed little over a period of twenty years, with a few new homes and two or three new non-conforming businesses. A three-story brick house on a main avenue in the area was sold to one Vancil by a contract conditioned on the issuance of a permit to use the building for a funeral parlor; and a permit for such use was first issued and then revoked. The Springfield zoning ordinance made no mention of either permitting or prohibiting funeral parlors, but business was forbidden generally in a residential area. The "A" Residence Zone permitted houses, small apartment buildings, boarding houses, farming and truck gardening, educational and other similar institutions, and various buildings accessory to those listed. In the City's action to prevent establishment of the funeral parlor, defendant argued both that funeral parlors were not illegal under the ordinance and that such a prohibition as applied in this district would be unconstitutional.

In the opinion it was held first that a prohibition of funeral parlors (if it should be found to exist) would be reasonable in such a residential area. The Court then referred to earlier cases stating that undertaking was a business, and so forbidden in a residential zone. In approving the injunction, the Court also noted that other persons had built homes in reliance on the existing zoning regulations.

Commercial Use of Public Airports Operated by Lessees

WISCONSIN. *Wussow* v. *Gaida*, 29 North Western (2d) (Wisconsin Supreme Court, October 14, 1947).

Under the relevant Wisconsin statutes, the members of a local airport commission may make employment and other contracts for an airport, and in particular

> . . . may contract with private parties for a term not to exceed ten years for the operation of the airport, including all necessary arrangements for the improvement and equipment and successful operation thereof. Provided, that in no case shall the public be deprived of equal and uniform use of the airport.

Under the statute, one Wussow made an agreement to lease the Shawano County Airport for five years, to devote his full attention to and to "have sole charge of" the airport, to carry insurance for airport liability and property damage, and to receive the income for concessions and rentals. On the land adjoining the airport, one Gaida had for several years been carrying on an aircraft sales business, and along with that business had been using the airport for flight instruction and taxi service. The lessee brought an action to restrain the officials of the sales company from continued use of the airport for commercial uses, such as flight instruction and taxi service, and alleged a great loss of earnings to the lessee as a result of that business. The lower Court held for the lessee and also assessed damages, but the Wisconsin Supreme Court reversed.

Although the lessee argued that the guarantee of equal use of the airport by the public (in the final sentence in the statute quoted above) was limited to the public use, the Supreme Court held that no distinction between private and commercial uses appeared in the clear words of the statute. The lessee was, therefore, held not to possess the exclusive right to use of the Shawano airport, and the order granting him an injunction against the sales company was reversed. However, the Court indicated that the lessee might have a straight action for damages.

Impounding Cattle

GEORGIA. *Hall* v. *Twinstead*, 45 South Eastern (2d) 412 (Georgia Supreme Court, February 13, 1948).

A clause in its charter gave Twin City authorization to regulate or prohibit various domestic animals from running at large within its corporate limits. In view of this, a petition to enjoin the city from impounding cattle that were running at large was dismissed.

The Expanding Scope of Constitutional Protection—The Right to Prune Trees

OHIO—*Murray* v. *Heabron*, 74 North Eastern (2d) 648 (Ohio Common Pleas, May 2, 1947).

In the familiar situation presented here, the boundary between two pieces of property ran between a tree's trunk and the line of its outer branches; and, when the neighbor proposed to cut back the overhanging branches, an objection was raised by the owner of the other lot where the trunk was. The neighbor therefore brought an action for a declaratory judgment upholding the right to prune. The lower Court opinion granting such a judgment was orthodox in result but was unfortunate in the grounds chosen for the decision; what is even more unfortunate was that the lower Court opinion was reported.

The tendency of trees to ignore property lines has been the subject of a considerable volume of litigation in recent years. (See Macneil, *The Growing Lawlessness of Trees, McMurray Essays* (395 [1935]). However, as the Court noted with surprise. Ohio law had not previously spoken out as to the remedies available to adjoining and shaded landowners. No doubt in a rational community the arrangement of trees and buildings to provide for the best advantages of sunlight and shade would require taking several factors into account—not including, however, any of the considerations emphasized in the Court's opinion here.

At common law, the rights of a landowner over the area within the boundaries of his property were thought to extend *ad coelum et ad infernos*—up to the sky indefinitely and well down into hell. The doctrine developed from a medieval monk's remark, which was probably misunderstood in any case. While this theory gave each landowner the right to take action against obtruding trees when that problem came up, it did not raise any particular complications in other respects. However, with the development of airplanes numerous trespass suits were brought, and as a result this statement of the doctrine was abandoned or sharply limited all over the country with remarkable speed. Nevertheless, the Ohio Court here repeated it in its original glory:

> "... we find that a landowner's property rights extend indefinitely upward, and that those rights are protected from invasion to the same extent as surface rights."

It was therefore held that the neighbor could prune the overhanging branches.

While the above is presumably harmless, another even less relevant basis for the decision could conceivably cause trouble in the future. A section of the Ohio Code penalizing any destruction, etc., of trees situated on another person's land was invoked as a defense to the action here. In discussing this point, the Court held that the guarantee in the Ohio Constitution of the right to protect one's property included the right to prune overhanging trees; and the Fourteenth Amendment to the Federal Constitution was held to protect the same right. The Court therefore held that the Ohio statute mentioned above could not be constitutionally applied to cover this situation. Under the logic of this ruling, therefore, if either the majority in a community or a legislative body should decide that shade trees should be left unmutilated there, they would be precluded as a matter of constitutional law from doing anything about it. The right to prune has apparently joined the Bill of Rights.

Reprints of the article in the March issue, "No City Issues Zoning Bonds," by Edward M. Bassett, are available without charge upon application to *The American City*.

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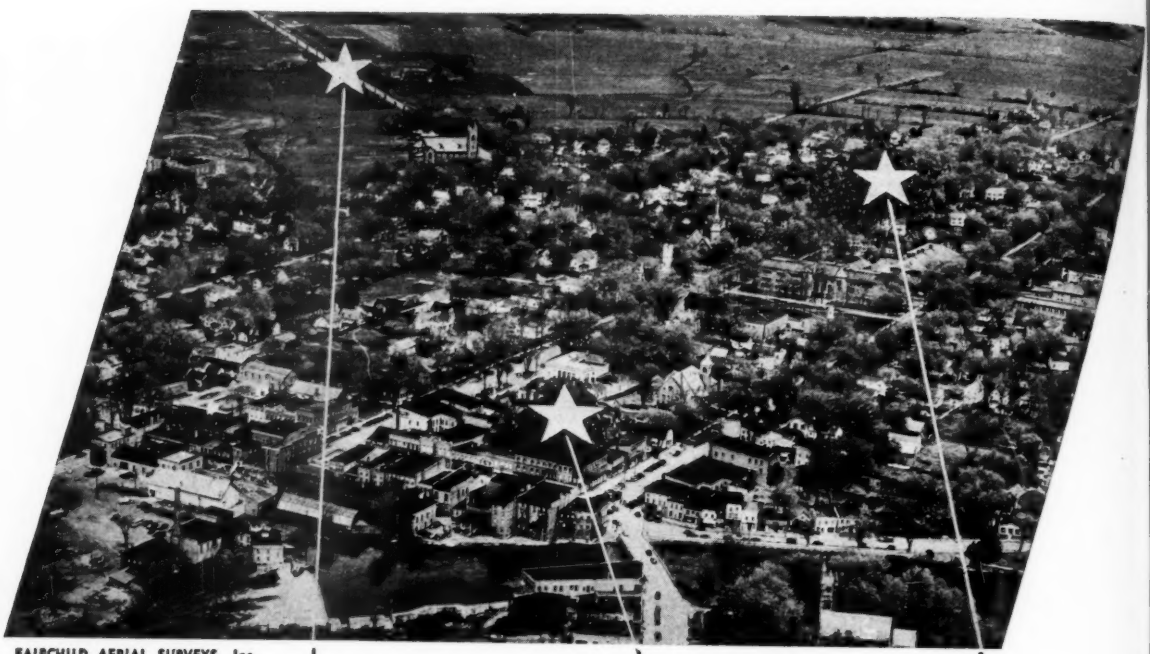

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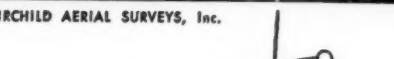

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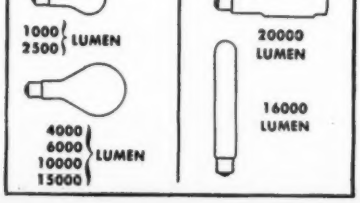
STANDARDIZE on REFRACTORS . . . They provide more visibility for every dollar spent. The more efficient light control of the HOLOPHANE REFRACTOR puts the light where it is most needed on the street—building up pavement brightness with greater uniformity of distribution. The net result is better street lighting, in terms of less night accidents and deaths, improved civic safety conditions, and more pride in the community.



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XUM

Canadian National Exhibition Plans Its 70th Year

By R. H. SAUNDERS
Mayor
Toronto, Ontario

THE City of Toronto, owner of the Canadian National Exhibition—the world's largest annual fair—is planning that the 1948 showing next August shall be even better and more extensive than ever before.

The Canadian National Exhibition has land, buildings, and equipment worth $26,000,000 and covers 350 acres, stretching for a mile and one-half along the shore of Lake Ontario in the City of Toronto.

Although the fair belongs to the people of Toronto, its cost to the city for debt charges and maintenance of grounds and buildings, since it was established in the year 1878, has been negligible when compared with the benefits it has brought to the municipality.

The city issues debentures to cover the cost of expansion programs, and the annual surplus revenue from the operation of the exhibition itself is applied to the retirement of these debentures. In the case of some of the buildings, such as the Food Products Building, the Electrical and Engineering Building and the Automotive Building, exhibitors signed up for display space for ten or twenty-year periods, so as to insure a means of underwriting the retirement of the debentures issued for the construction of these particular buildings.

The C. N. E. has always led in presenting outstanding developments in science and industry. In their earliest stages, electric lighting, automobiles, electric railways, aviation, wireless telegraphy, telephony, radio, and x-ray were demonstrated. In 1947, the tradition was maintained with displays of the latest in television, radar, radio automobiles, aviation, jet propulsion, and plastics.

International Exhibits

Every encouragement is given to agriculture, horticulture, arts, education, manufactures, business, sports, and women's activities. In 1947, agricultural prizes totaled $125,000. There were extensive exhibits by the Canadian Government, the Province of Ontario, the United Kingdom, Australia, New Zealand, the Union of South Africa, India, Pakistan, and the Government of France.

The friendly relationship of Canada with the United States was given tangible expression on Warriors' Day, when 50,000 Canadian, British, and American Legionnaires marched through Exhibition Park. The United States Navy Band played daily throughout the exhibition. Thousands of Americans, most of them from New York, Pennsylvania, Ohio and Michigan, visited the C. N. E.

Behind all this, there is a city within a city. The C. N. E. has its "City Hall"—the administration building—police and fire departments, a post office, a hospital, street cleaning and refuse collection services, a telephone exchange and telegraph offices, banks, a children's playground—everything except hotels.

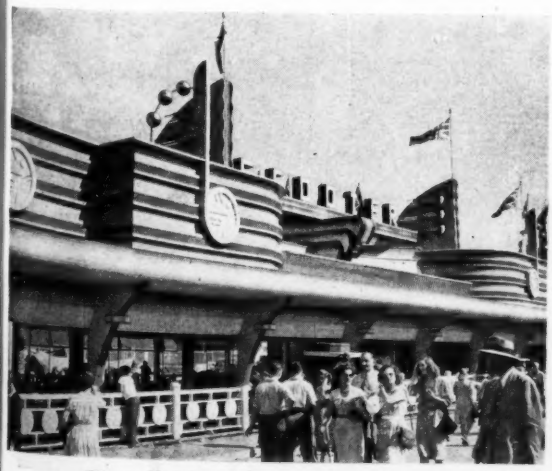
New Improvements

Great as it is, the C. N. E. does not stand still. A vast new grandstand—the first unit of which will seat 22,000 people and cost $2,500,000—is under construction and several new buildings are planned.

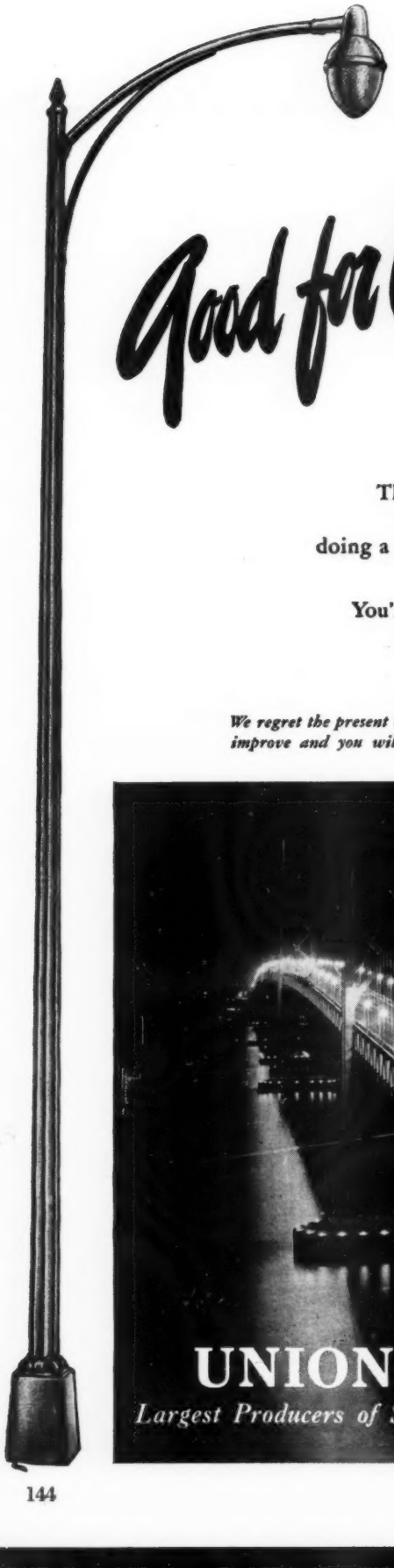
During the 14 days of the 1947 exhibition there were 2,366,500 visitors—the greatest attendance ever registered, exceeding the previous high mark set in 1928 by more than 300,000.

From all parts of Canada and the United States—and from other countries, too—executives of other exhibitions visit Elwood Hughes, C. N. E. general manager, to see what he does and how he does it. In 1947, members of the New York State Fair Commission and W. H. Hitzelberger, executive vice-president of the Texas State Fair, were visitors.

When the 1948 C. N. E. opens next August, there will be more and better exhibits, in line with the exhibition's policy of never remaining content with what has already been done, and there will be the warmest of welcomes awaiting visitors from every land.



The streamlined fronts of the pavilions at the Canadian National Exhibition are an added attraction.



Good for life!

When Union Metal tapered steel lighting standards go in, they're *in for good*—in two important ways.

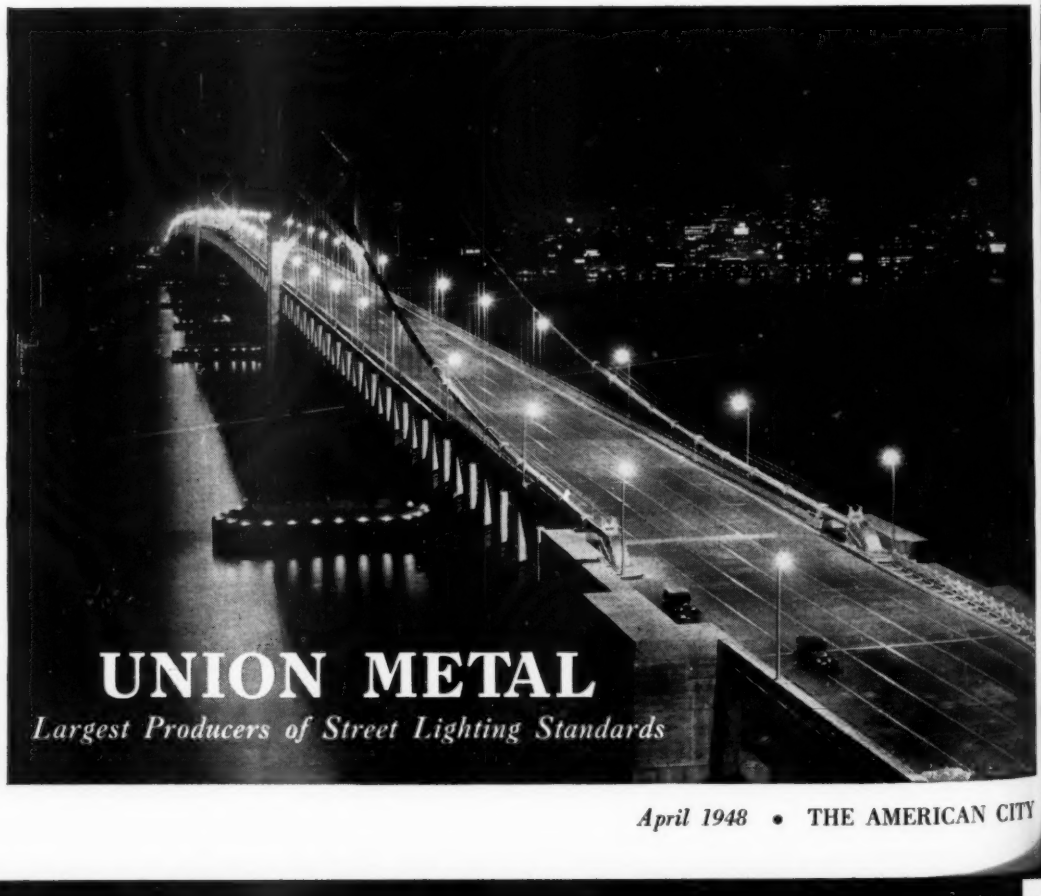
First, they're long-lasting. A special cold-rolling process makes them unusually strong and durable. They're as serviceable and smart-appearing *years* after installation as on their first day "up". Communities need have no worries that they'll grow out of date, or out of harmony with progressive street lighting plans.

Just as important as their strength and durability are their long-term benefits in *safety*. Statistics show that improved street lighting reduces night accidents, increases protection against crime, safeguards property.

Thousands of Union Metal steel lighting standards are serving faithfully in hundreds of cities and towns, night after night—doing a good job "for life."

Include them in your street lighting improvement plans. You'll gain *extra* dividends in community satisfaction *and* safety. The Union Metal Manufacturing Company, Canton 5, Ohio.

We regret the present extended delivery schedules due to the steel shortage, but this will improve and you will find Union Metal lighting standards well worth waiting for.



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Providing Places For Planes to Park

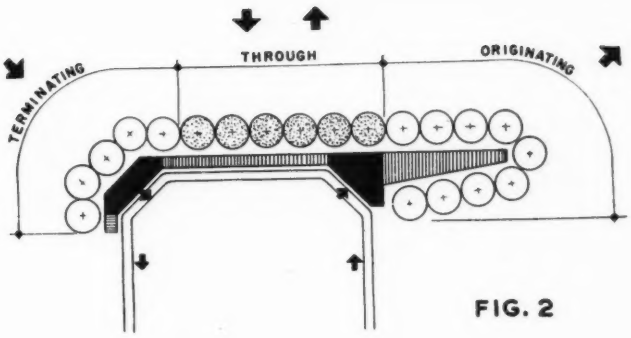


FIG. 2

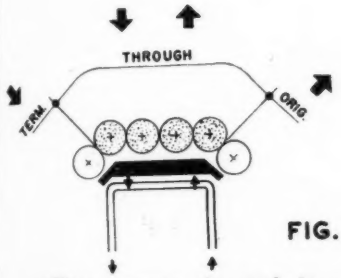


FIG. 1

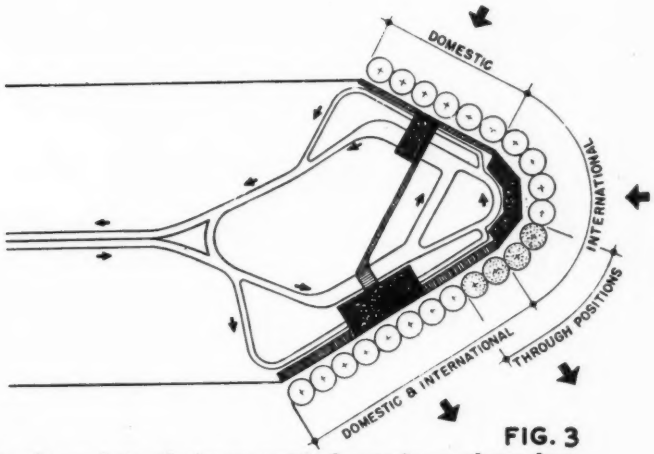


FIG. 3

Three separate airport designs, each keyed to the analysis of airport terminal capacity as shown here.

THE REAL key to the most difficult airport-design problem, which is that of the terminal building, is the determination of the number of plane-parking positions that traffic to the airport will require. One rule-of-thumb presently used, says Walter Prokosch, vice-president of George S. Armstrong and Co., Inc., is to allow four operations per hour per gate position. This procedure, however, is apt to result in wasteful designs. In a paper delivered before the Society of Automotive Engineers' air-transport-engineering meeting in Kansas City recently, he recommended the following steps, which will lead to improved solutions from an economic as well as engineering standpoint.

1. By an economic study determine the potential daily air-passenger traffic and classify it into various categories, such as feeder-line, trunk-line, international.

2. From the air carriers serving the community, obtain anticipated passenger traffic and plane operations on a daily basis. Get the information projected ahead as many years as possible. Lacking this, get an estimate from them regarding when they expect traffic to level out.

3. From these data prepare a traffic schedule indicating the number of passengers and plane operators for each airline and for each type of service, per day. This schedule will also show what proportion of traffic will be terminating or originating and what proportion will be through traffic. The traffic schedule should be prepared for a two-year, five-year, and ten-year period. The conversion of passenger-traffic volumes to plane movements should be made on the basis of 14 passengers per plane for feeder-line traffic and 30 passengers per plane for trunk-line and international.

4. Convert daily traffic to peak-hour traffic, assuming 20% of daily traffic per peak hour occurs.

5. Assemble information on the number of different directions which the air carriers fly from the given city, how many different carriers will use the terminal, and other similar data which will affect the operation of the terminal. If, for instance, a given locality is situated on the crossing of two air routes, one may expect occasions of longer stopover in order to provide close connections for the passengers.

6. Convert the number of operations per peak hour to the number of gates required based on the following figures:

Feeder Line:
- 5 minutes per operation for through or terminating flight
- 12 minutes per operation for originating

Trunk Line:
- 7½ minutes per operation for through or terminating flight
- 15 minutes per operation for originating

International:
- 15 minutes per operation for through or terminating flight
- 30 minutes per operation for originating

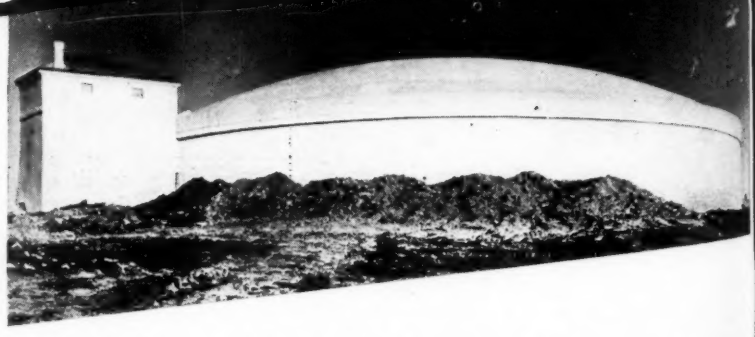
The figures indicate a complete cycle of use for a plane position, including taxiing into position, performing the necessary operation, and moving away from the position. A gate designed for through feeder-line traffic would handle 6 schedules per hour, with two operations per schedule.

If this procedure is followed, various planning improvements will be effected: that is, reduced walking distances for passengers; simplified passenger circulation, and more direct taxi pattern for airplanes. By reducing the number of plane gates required, both capital costs and maintenance will be reduced. Mr. Prokosch also demonstrates the increase in concession revenue potential which will result.

Halifax, N. S. reservoir before rehabilitation.

PRELOAD PRESTRESSED DOMES

Rehabilitation of Halifax Reservoir With Preload Wire Prestressing . . .



Reservoir after rehabilitation, showing Preload Prestressed Dome.

Reconstruction of the 3½ million gallon Halifax, N. S. reservoir by Preload Company of Canada Ltd. (Subsidiary of The Preload Corp. of New York) and Canada Gunite, Ltd., plus the addition of 500,000 gallons new capacity, has been carried out by the use of PRELOAD WIRE PRESTRESSING on the dome ring which carries the load of the new dome roof, the largest of its kind ever built, (164 ft. 3 in. diameter). 42 miles of 0.162" high tensile (200,000 psi.) strength wire was applied by the PRELOAD WIRE PRESTRESSING MACHINE at an initial stress of 140,000 psi. The wire was applied in five layers, each layer of wire being bonded with a coating of gunite and the entire ring being finished off with a one inch gunite cover coat. (See articles in June '47 Journal of American Water Works Association and Aug. 7, 1947 Engineering News-Record).

This reservoir, built in 1913, represented a serious problem caused by erosion and spalling due to ice action and severe winter weather conditions. The availability of materials for this type of reconstruction, (to meet an urgent time factor) and substantial economies over other methods of rehabilitation, all made it possible for PRELOAD to demonstrate the same economy and freedom from long-term maintenance costs which characterizes PRELOAD'S construction of new tanks and other circular structures.

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Recent City Manager Appointments

The following portraits are of city managers whose appointments have been announced in recent issues of *The American City*.

Carleton F. Sharpe
Hartford, Conn.

T. E. Fennessey
Tulane, Calif.

Clyde E. Swank
Charleston, Mo.

Jesse Hughey
Madison, Fla.

W. J. Heard
Kinston, N. C.

CHARLES E. BLACK, an ex-army officer, has been appointed at Delray Beach, Fla.

JAMES E. BURNETTE has succeeded D. C. TURNER at Largo, Fla.

JAMES L. GALLOWAY, manager of Marysville, Mich., since 1942 has been appointed first manager of Glenwood Springs, Colo.

L. EVERETT GERRISH, manager of Brownsville, Maine, 1944-46; Dexter, Maine, since 1946, has been appointed first manager of Bar Harbor, Maine.

GORDON GARY has succeeded GLEN J. HART as manager of Saline, Mich.

HARRY HALE is the new manager of Carey, Ohio.

OSCAR HESCH, a former mayor, succeeds J. B. MORLIDGE at Newport, Ky.

GEORGE HEIN, manager of Lehighton, Pa., since 1945, has been appointed first manager of Oakmont, Pa.

NORMAN H. MACDONALD, formerly of the State Health and Welfare Department, has been appointed at Presque Isle, Maine.

O. H. MANUEL, an engineer, succeeds D. M. MACBRIDE at Woodstock, N. B.

F. J. MURPHY has succeeded VINCENT L. CORONA at Sherrill, N. Y.

GEORGE A. RANDALL has succeeded WILLIAM A. GRIFFITH at Manchester, Vt.

A. V. ROSSER has been appointed at Cairo, Ga., to replace DONALD P. WOLFER, who resigned to accept an assistantship in the San Diego manager's office.

JOHN BACON SAUNDERS has been appointed acting manager of Bonham, Texas, to succeed L. R. BURROW.

JAMES F. SHURTLEFF, manager of Mansfield, Mass., 1943-47, and of Brookfield, Ill., since August 1947, has been appointed first manager of Saugus, Mass.

FRED SNYDER has been appointed at Edmond, Okla., to succeed JOHN P. HAYERS.

ROBERT G. WILSON has replaced J. S. BUTLER at Walters, Okla.

CLARENCE E. RIDLEY
Director
International City Managers Association
Chicago, Ill.

Buffalo Seeks Chief Planner

APPLICATIONS are being accepted for the position of Chief Planner of the City Planning Commission, Buffalo, N. Y., by the Municipal Civil Service Commission of that city. The salary range is between $4,751 to $5,250 a year, with the usual starting salary announced as $4,850. Application forms are available from the Civil Service Commission, 1001 City Hall, Buffalo 2, N. Y., and should be returned by April 23.

Baytown Approves Up-to-Date Charter

TERMED "one of the best in the state" and "outstandingly excellent" by experts, voters in the City of Baytown, Texas, (a consolidation of Baytown, Goose Creek, and Pelly), approved a new charter for that municipality on January 24. As nearly as state laws and local circumstances would permit, it was patterned after the *Model Charter*, published by the National Municipal League.

Bill N. Taylor, City Manager and consultant to the charter commission, reports that after a tentative draft of the proposed charter was completed, it was sent for review to a number of agencies in the municipal field. The changes that were suggested were taken into consideration by the charter commission in writing the final draft.

Some of the difficulties involved in the preparation of the Baytown charter were described on p. 88 of the September 1947 issue of THE AMERICAN CITY, "Three-way Municipal Consolidation Presents Unusual Problems."

Resolution Calls for More Informative Legal Opinions on Municipal Bonds

More informative legal opinions, of greater value and protection to investors and others, was requested in a resolution adopted at the 1947 annual meeting of the Municipal Forum of New York, an association of persons interested in state and municipal securities or engaged in some allied field.

The text of the resolution is as follows:

RESOLVED, that the Municipal Forum of New York recommend to all states, cities, and other bodies issuing bonds or other obligations commonly known as "municipal securities" that they request their bond counsel to include in their opinions regarding the legality of such securities the following statements, namely:

1. In the case of securities payable from ad valorem taxes on real estate, except state securities, a statement as to whether or not there is any limit prescribed by law on the rate or amount of such taxes;

2. In the case of securities payable from such taxes and also from special revenues which the issuer of the securities has expressly contracted or covenanted to apply, or is expressly required by law to apply, to the payment of the securities, a statement to the effect that the issuer has so contracted or covenanted, or is so required by law, together with a statement as to whether or not such contract, covenant, or requirement is an obligation running to and enforceable by the holder or holders of such securities, and as to whether or not there are or may thereafter be issued other securities legally entitled to share in such special revenues prior to or on a parity with the securities passed upon in the opinion; and

3. In all cases, a statement as to whether or not (by the terms of the securities or of a law applicable to the securities) the bonds are callable, i.e., whether or not they may be redeemed prior to their maturity without the consent of the holders.

Another reason why DUAL sets the pace in traffic control:

Specialized Service

SERVICE *after* the sale is a plus value that comes with every Dual Automatic Parking Meter. That's one of the reasons why they're favorites in cities from Canada to California to Florida.

Duals are designed and engineered like fine time-pieces. When they require occasional cleaning and servicing—as all fine time-pieces do—they get expert attention at the factory by specialists. And that's not all. Dual sends servicemen on periodic inspections—helps train cities' own personnel.

Consider these other Dual advantages, also. *They're weatherproof and tamperproof; meter setting works automatically—no levers; they're long-lasting, accurate, dependable.*

Long after Duals have paid for themselves, they provide steady income that can be used to help solve other traffic control problems. Find out how Duals can simplify traffic regulation in *your* city. Send for Bulletin DU-501 today, or ask our engineers for helpful survey service.

THE DUAL PARKING METER COMPANY
A subsidiary of The Union Metal Manufacturing Company
Milford Building • Canton 2, Ohio

WHEN IT COMES TO CONTROLLING PARKING, YOU CAN DO IT BETTER WITH DUALS

Take a New Look at Traffic Congestion

By ED J. BUHNER, *President*
American Trucking Associations, Inc.
Washington, D. C.

TRUCKS and tractor-trailer combinations in the United States have climbed from 4,859,000 in 1941 to more than 6,500,000 now. What's municipal about that? Well, where do trucks go? They go to the towns and cities—where they fight traffic congestion. I think the term "hardening of the traffic arteries" was first promoted in one of our advertisements urging shippers to study their need for off-street loading and unloading facilities. We still don't know the answer.

A lot of the discussion about traffic congestion concerns truck operation. Every railroad entering every big city in the country, every steamship, and every airline is completely dependent upon trucks. It can be said of much of the nation's goods that no matter how it is shipped, it still begins or ends on a truck. I am sure that the public now recognizes the impossibility of operating a modern city without truck transportation. And the American Road Builders' Association has estimated there will be an increase of 35% in truck traffic by 1950.

Such congestion not only inconveniences business, but it is very costly. The American Road Builders' Association urges that shippers and retailers work with motor carriers to "reduce time-wasting traffic congestion and effect economies in central business district deliveries."

"Where alleys are not adequate, which is the rule, loading and unloading at retail stores and markets is a source of traffic congestion. Many stores claim that even a restriction as to the time of loading and unloading of trucks imposed a confiscatory hardship on them."

"That it is necessary to provide for truck-loading and unloading on the streets if alleys are inadequate or nonexistent goes without saying, because the traffic in goods thus moved is the basis of business activity. Central business districts of cities and towns cannot live without trucks any more than without other forms of transportation."

To a great extent we have many of the same buildings lining the streets of our downtown sections that we had 20 and 30 years ago. Buying habits of businesses changed, too, when truck transport came along. Before that, business houses had to buy well in advance. Today, they follow the price market and buy hand to mouth. Trucks deliver overnight.

Don't ever forget that much of our traffic congestion can be traced to this merchandising revolution which was based on the speed and flexibility of truck transport. The key point in this whole problem is the fact that this way of doing business is being threatened every time anything curtails or prevents truck delivery, whether it be a city ordinance or a traffic jam.

Danger of "Quickie" Solutions

That brings me to the many suggestions always advanced whenever this subject comes up, and which are directed to curtailing and restricting truck transportation. The line of thinking seems to go like this: "Our streets are blocked by cars, buses, taxicabs, street cars, and trucks. All right. We don't ride in trucks. Let's bar the trucks or at least let's keep them off the streets during certain hours."

Which is more important—a truck carrying food which will feed several hundred people, or a passenger car carrying one man to a parking spot near his office? I am not suggesting that any kind of vehicle be barred from streets at any time. Streets were made for vehicular traffic, and it's up to all of us to figure out how we can keep vehicles moving on them. But watch these quick and easy solutions.

The so-called idea of night-time deliveries is another one of these "quickie" solutions. Exercising our free choice, we run much of our over-the-road traffic at night. We do it to suit the needs of business. We pick up newly made goods at the close of business today and deliver them tomorrow morning 300 miles away at the opening of business. We run at night because that is the kind of service and cooperation shippers and receivers find most valuable.

But we cannot do it in the cities. Night-time city pick-up and delivery means a great deal more than just keeping truck drivers and helpers working at night. It means that a substantial portion of the working force in many lines of business would have to work, too. Remember, in every pick-up and every delivery there is a ground crew just as as there is one for every plane flight. And the ground crew outnumbers the transport workers.

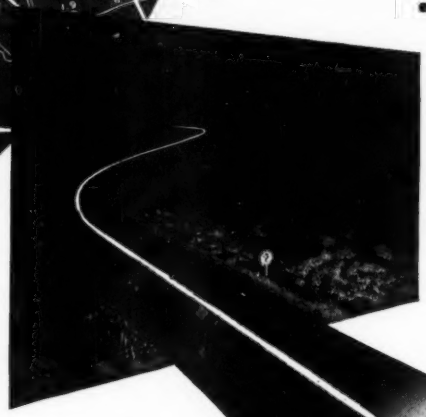
The thousand and one items of business and commerce which we deliver and pick up all day long in the downtown areas of cities are the very things which keep the people in these places working. If truck deliveries were restricted to night-time, downtown New York would blaze like a roman candle from dusk to dawn.

When New York found, many years ago, that surface transportation of passengers was jamming up, what happened? New York went up in the air with elevated trains and burrowed under the ground with subway trains and moved its teeming millions at high speed from home to work and back again. I don't say that we need to double-deck our streets or go underground, but I am illustrating the kind of thinking which must be brought to this subject.

Those cities which have been most successful in solving this problem are cities in which public-spirited citizens and interested groups really tackled the problem. Membership on such committees or organizations must be representative. What would you think of such a group if it failed to include anyone from the trucking industry?

A LONGER LIFE-TIME...
with the PRISMO LIFE-LINE

Enlarged side view of embedded PRISMO SPHERES



. . . It saves lives day and night for the longest number of years.

WHEN YOU LOOK AT A HIGHWAY CENTER LINE . . .

- If it's the brightest—it's Prismo
- If it has reflected with the *most* brilliance for the longest time—it's Prismo
- If the cost has been the least—it's Prismo

PRISMO HAS NO EQUAL. The Prismo Life-Line is the most brilliantly reflective marking material that a highway can have. It's optical-clear tiny glass spheres—imbedded in the safety lines of the road—reflect life saving light at the widest angle of sight.

WRITE FOR THE REASONS that prove the scientific superiority of the Prismo process—the pioneer process that has been *tested by time.* Find out why Prismo is standard in many cities, counties and states for all danger points including no passing zones, fog lining and municipal marking.

PRISMO SAFETY CORPORATION, HUNTINGTON, PA.

Jacksonville's Life-Saving Traffic Markings

By LIEUT. J. H. ALLEN
Traffic Division, Police Department
Jacksonville, Fla.

IT WAS apparent three years ago that action must be taken to stop the trend in Jacksonville's traffic accidents —43 deaths in 1944 and 41 deaths in 1945. Congestion in downtown Jacksonville was costing the motoring public an estimated $3,500 daily. It was time to provide pavement markings and traffic signs conforming with the specifications set up in the Manual of Uniform Traffic Control Devices.

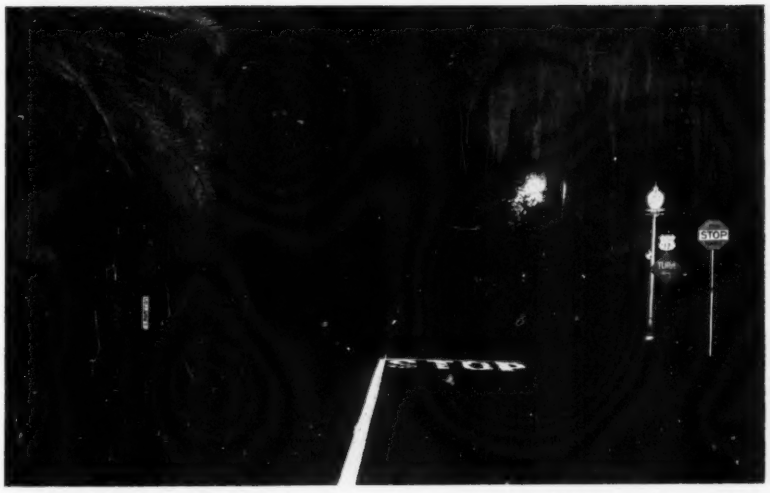
A set of standards was developed along the lines of those specified in the manual. These require, on multi-laned streets, a 4-inch continuous white center line with a broken or skipped quarter line of the same color. A yellow continuous line was adopted as a "no passing" or barrier line on both vertical and horizontal curves. These barrier lines are also used to prevent vehicles from crossing to the left side of the street when approaching a one-way section on a street.

At first, pavement markings were reflectorized by distributing glass spheres by hand. This method was spotty and costly until our pavement-marking equipment was fitted with a sphere dispenser, which distributed the spheres into the plastic binder. Dispenser and beads are the Life-Line Package of the Prismo Safety Corporation, Huntingdon, Pa. This dispenser measures the distance covered, allowing the operator to compare the distance with the recommended number of gallons to be used. The measuring device also makes is possible to check the day's output of a striping crew. The equipment and material lays a line which, for many months, retains its natural visibility both day and night. The result is lower maintenance cost.

In making the traffic directional signs, a binder of the desired color is applied to the surface of the sign. The glass spheres are allowed to spill over the wet binder, covering the entire surface of the sign with millions of glass spheres. These preserve the color and usefulness of the sign for years.

This reflectorization can be applied to a flat or to an embossed sign at a cost of approximately 6½ cents per square foot. After the binder has dried, the legend is applied to flat signs by the use of a silk screen stencil or, on an embossed sign, by a hand roller-coater. The same material is used to reflectorize safety islands, bridge abutments, narrow bridges, and guardrails.

Traffic fatalities have decreased 69%. This is due to the markings and stricter enforcement of the traffic rules and regulations.



Traffic fatalities in Jacksonville, Fla., have decreased 69%, thanks to these new traffic-directional markings and signs. A stricter enforcement of the traffic rules and regulations has also been a large factor in this good record.

Metered Parking Successful In San Francisco

SAN FRANCISCO'S first parking meters, installed in an intermediate business zone, have been so successful that merchants in other districts of the city are requesting metered parking. The installation of 550 Park-O-Meters, manufactured by the Magee-Hale Co., Oklahoma City 2, Okla., has eliminated all-day parking and made it possible for shoppers and business people to find space for temporary parking. Our parking limit throughout the district is one hour at a fee of 5 cents per hour and 1 cent for 12 minutes. These automatic-type meters, costing $59.30 per meter, are to be paid for from one-half of the receipts.

BEN G. KLINE
Executive Secretary
to the Chief Administrative Officer
San Francisco, Calif.

Yes FOR ANGULAR PARKING TOO

ALFCO TWIN
AUTOMATIC
PARKING METER

The Alfco Twin is a Penny-Nickel automatic type meter designed for both parallel and angular parking.

Yes TWINS CAN BE USED ON PRESENT POSTS IF DESIRED

One Alfco Twin Meter Serves Two Spaces! Costs about 50% less to Buy and Maintain!

The Alfco Twin Automatic Parking Meter saves a city about 50% of the initial cost of installation of parking meters, eliminating half the sidewalk encumbrances and in addition saves the city 50% of the annual costs of maintenance, service, collection and all other costs incidental to the upkeep of parking meters.

Further information sent upon request.

INTERNATIONAL METERS, INC.
Executive Offices: 100 East LaFrance Street, Elmira, New York
General Sales Office: 41 E. 42nd Street, New York 17, N.Y.

SUBSIDIARY OF
AMERICAN-LAFRANCE-FOAMITE Corporation
ELMIRA NEW YORK U.S.A.

ALFCO

A Juvenile Traffic Court Judges Alameda's Bicycle Violations

Officer Charles Gully, in charge of the Bicycle Traffic Court and School, gives out bicycle licenses. The Boys' Court sees that the ordinance is observed.

HIGH SCHOOL students act as the judges of juvenile violators of the bicycle ordinance in a Bicycle Traffic Court established in Alameda, Calif. The program is directed by the Bicycle Bureau of the Police Department, with the cooperation of the city's Justices' Court and the schools.

If youngsters have violated any of the regulations listed in the 24-page booklet issued to each bicycle owner, they are brought before the court, which consists of a chief justice, two associate justices, a bailiff, and an adult counselor, who is the traffic officer in charge. The students are elected by the student body and the high-school faculty. Court sentences may include a reprimand, an order to write a composition of from 200 to 1,000 words on safety topics, copying out sections of the ordinance a number of times, or attendance at a bicycle traffic school. In the case of repeated offenses, the bicycle is impounded for a week or a month, or the parents are instructed to deprive the child of the use of his bicycle for a certain period.

There is a 25-cent fee for license, registration card, and plate. Each bicycle, properly equipped, is brought to the Police Department when the license is obtained. A record is made of the manufacturer's serial number, and a police serial number is stamped into the frame of the bicycle. As an aid in reducing theft, every dealer keeps a record of all sales.

Topeka, Dayton, Milwaukee, and Berkeley are some of the other municipalities having juvenile traffic courts administered chiefly by youngsters.

BERTHA A. GARDINER

Need for Up-to-Date Signs on Highways and Streets

By THEODORE A. De POSTELS
Architect
New York, N. Y.

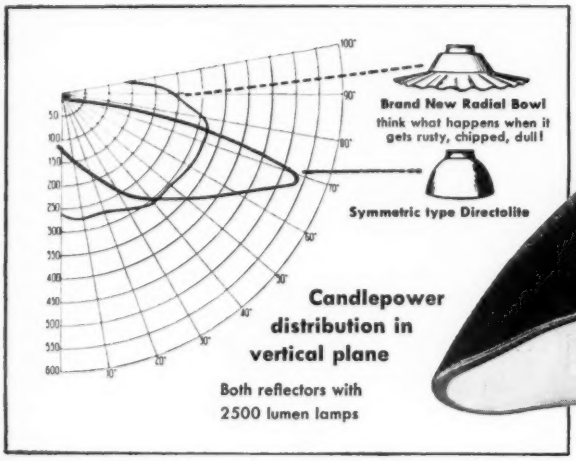
THE need for improved street and highway signs was painfully evident to me on a recent 8,000-mile auto trip through New York and neighboring states. There is a great necessity for better designed signs and for many more of them.

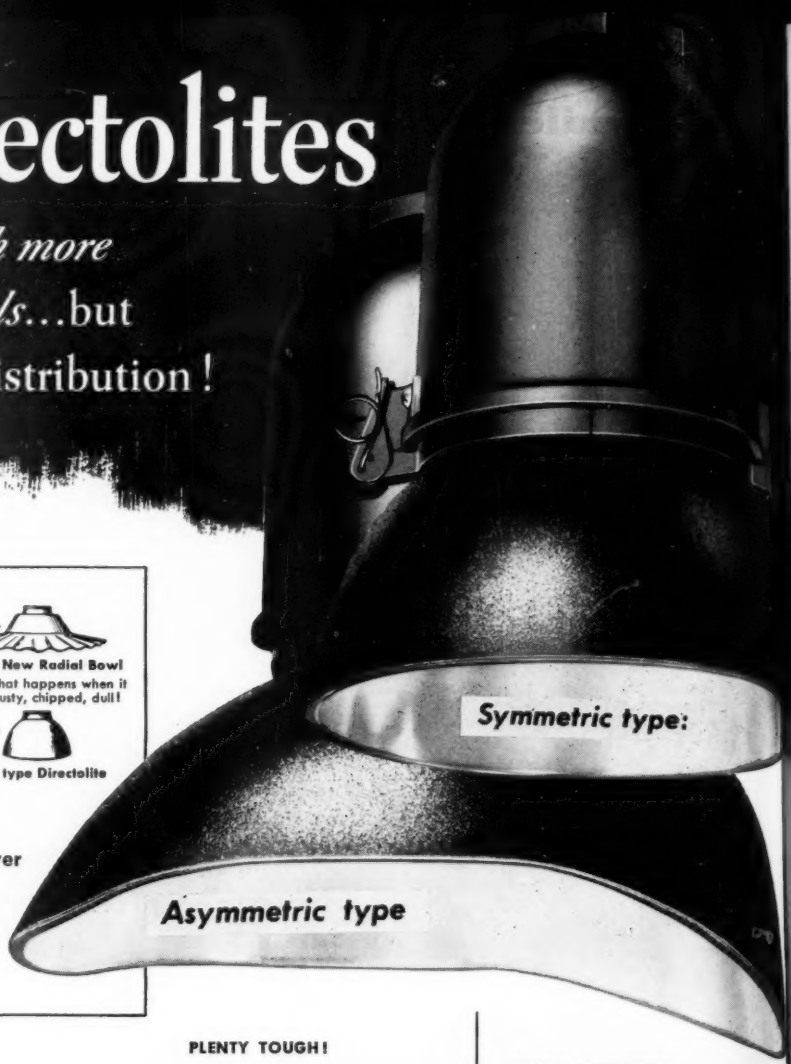
Cleaning and repainting are the first requisites. Next, signs should be twice their size and placed preferably at one angle of vision, where they may be read from a considerable distance. Signs should be placed high enough so that a view of them will not be obstructed by cars in front of the driver. Important signs should be painted dark red and illuminated 24 hours a day. When signs have to be grouped, the most important should be conspicuous. Entrances and exits should be announced by outstanding signs placed well in advance of these points. Other signs should indicate reduction in speed before approaching important intersections or dangerous spots. At any entrance or exit of a highway passing by or through a town or village, a special sign should give the name of the city, the name of the next town, and the distance.

With these innovations, there should be less confusion and fewer accidents.

L-M Directolites

*don't cost much more than radial bowls...*but compare the light distribution!


Brand New Radial Bowl
think what happens when it gets rusty, chipped, dull!
Symmetric type Directolite
Candlepower distribution in vertical plane
Both reflectors with 2500 lumen lamps



People can see and appreciate the improvement when L-M Directolites are installed. Today there are more than 3000 Directolites in the Chicago area alone, giving excellent service and added safety.

Aluminum backing, welded to plenty-tough quenched glass; weatherproof coating prevents corrosion. Specular reflecting surface stays clean and bright. One asymmetric and two symmetric sizes, produce I.E.S. light distribution types II and V, respectively. For 100, 150, or 200 watt multiple or 1000 or 2500 lumen (5⅜") series lamps.

Get Brightness this Easy Way

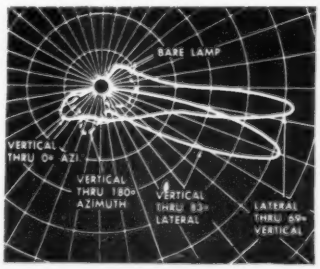
Learn how Directolites will brighten your outlying areas this painless, low-cost way. L-M's Lighting Engineering Service is outstanding, too! Write, wire, or phone **Line Material Company, Street Lighting Division. Milwaukee 1, Wisconsin.**

PLENTY TOUGH!

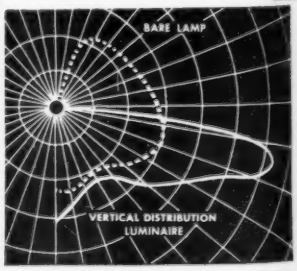
Directolite reflectors are tempered glass given a quenching treatment which makes it tough, highly resistant to shock shot, stones. Four times as strong as usual pressed glass. If it should break, it shatters to **powder.**

INTERCHANGEABLE WITH PRESENT EQUIPMENT

Fit either series or multiple heads. L-M Directolite heads also fit L-M Spherolites or Controlites—if neighborhood grows and needs more light, you change only the reflector.



Asymmetric type candlepower distribution



Symmetric type candlepower distribution

LINE MATERIAL Street Lighting

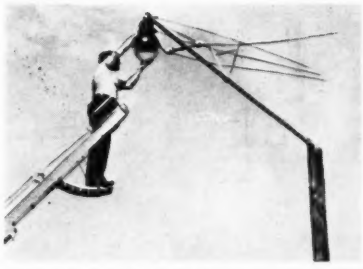
L-M DISTRIBUTION EQUIPMENT INCLUDES: Distribution Transformers • Fuse Cutouts and Fuse Links • Lightning Arresters • Oil Switches • Pole Line Hardware • Line Construction Specialties • Underground Equipment • Fibre Conduit • Street and Airport Lighting Equipment • "Wired Radio" Control Equipment • Capacitors

Extensive Mercury-Vapor Lighting In Yakima

By GIBBONS CLARK
Yakima, Wash.

YAKIMA is now the best-lighted city in the West," said Paul B. McKee, president of the Pacific Power and Light Company, in a recent talk before the Yakima Chamber of Commerce. The proof of this statement was on the night of December 31, 1947, when Yakima's 1,000 new street lights spread 6,540,000 lumens of glareless light over the entire city. The difference between this illumination and the former 2,846,500-lumen output is outstanding.

In 1944, with a wartime-boosted population of 40,000 (compared with the 1940 census count of 27,000), the question of adding more light on Yakima's streets was discussed between the city and the utility. The Pacific Power and Light Company requested a 25-year power franchise, proposing to extend and modernize the street-lighting system. The voters granted the franchise.



A new installation being serviced from an extension ladder attached to a maintenance truck. Guardrail insures safety.

The $225,000 lighting job consisted of three phases: the downtown business district, the residential areas, and the heavy-traffic routes into the city. Scientific traffic counts in the three zones preceded the layout plans for the installation. C. R. Laird, Pacific Power and Light Company street-lighting expert, patterned the lighting output according to I. E. S. recommendations. Police Chief Harold Robinson had an official hand in the new system, recommending the installation of overhead lights in all downtown alleys.

The new illumination consists of 20,000-lumen Westinghouse mercury-vapor lamps, mounted 28 feet above downtown streets on Union Metal ornamental poles, and suspended from 6-foot upsweep brackets. The poles are spaced three to a block. These 196 lamps provide an average of 1.2 lumens per

Yakima's new lighting is one of the largest installations in the West of 20,000-lumen mercury-vapor lamps.

ADJUSTABLE
COIN AND TIME COMBINATION

ADEQUATE
PROVED BY USE IN LEADING CITIES

AUTOMATIC
SIMPLE, FOOLPROOF OPERATION

ACCURATE
JEWELLED, PRECISION TIMING MECHANISM

In MICHIGAN, too

PARK-O-METER

Leads the Field!

More PARK-O-METER *Installations than* ALL OTHER MAKES *Combined.*

Park-O-Meter stands out head and shoulders above all competitors in automatic-conscious Michigan! Since V-J Day, more than 30 Michigan communities have chosen Park-O-Meters. Why this overwhelming preference? There are many reasons, among them these:

1) Only Park-O-Meter is fully adjustable for on-the-spot time and coin combinations that enable you to keep up with parking requirements as they change from time to time. 2) No Park-O-Meter need be decommissioned for repairs; quickly replaceable unit parts permit fast economical maintenance. 3) Only Park-O-Meter provides an adequate coin collection system that saves 50% in collection costs. These are some of the reasons why Park-O-Meters are now operating in more than 300 cities, including such as San Francisco, Washington, D.C., San Antonio, Buffalo and others.

Ask us to tell you the whole story . . . ASK TODAY!

Magee-Hale **PARK-O-METER COMPANY**

COMMERCE EXCHANGE BUILDING • OKLAHOMA CITY 2, OKLA.

Inspecting one of Yakima's new mercury-vapor luminaires are (left to right): L. W. Dick, Yakima's manager, Pacific Power and Light Company; George W. Clark, Commissioner of Streets; Mayor N. K. Buck, and Finance Commissioner L. F. Bishop.

square foot—the highest intensity of the I. E. S. recommendations for heavy pedestrian and heavy vehicular traffic. This is excessive lighting for our current traffic flow, allowing ample room for traffic growth.

Lamps Operated by Photo-Electric Cells

Each 16- and 17-lamp downtown series circuit is underground, operating automatically by means of General Electric photo-electric cells set high above the street. At predetermined operating time, evening darkness and morning dawn turn the lights on and off. Downtown alley lights are 2,500-lumen incandescent lamps enclosed in pendant luminaires and mounted on standard power poles.

The intersection lighting in the residential district is also of the overhead type. The 2,500-, 4,000-, and 6,000-lumen lamps, enclosed in pendant luminaires, are mounted at 27 feet. The higher-intensity lamps are placed at heavy-traffic intersections or at intersections with serious accident records. These intersection lamps are operated by astronomical time clocks, which accurately follow the seasons and regulate the lighting in accordance with each season. The clocks are manufactured by the Samgamo Electric Company, Springfield, Ill. The lamps are equipped with a 12-hour spring energy reserve to insure their working in case of power failure. Nearly 500 of these lamps have been installed, with 100 more on order. As the city expands, each new intersection will be lighted.

Ten-thousand-lumen incandescent lamps now light the heavy-traffic northern and southern entrances to Yakima. The lamps, spaced 135 feet apart in staggered arrangement, are supported by 16-foot mast arms which put the light source directly over the traffic zone.

Specially designed maintenance trucks provide quick and easy service work on the new installation. These Studebaker trucks have extension ladders, with a horizontal platform and guard rail at the top, which enable servicemen to work comfortably on the lamps. The ladders were manufactured by the American Coach and Body Company, Cleveland, Ohio.

Yakima's new lighting is one of the largest installations of 20,000-lumen mercury-vapor lamps in the West. The total annual cost to the city for all street lighting is $23,543, compared with $20,320 for the replaced system.

Social Significance

Since the lighting installation is of such recent date, no definite accident-crime figures are as yet available. However, some of the new units have been in operation since July 1947, and there is already a trend toward a reduced crime rate. In 1946, there were 137 larcenies compared with 113 in 1947; in 1946 there were 7 auto thefts, whereas only 3 were reported in 1947; in 1946, there were 43 thefts from autos, but only 33 in 1947; in 1946, 25 bicycles were stolen, against the 18 stolen in 1947; burglaries dropped from 37 in 1946 to a low of 11 in 1947.

When the new system is in operation for a longer period of time, there undoubtedly will be a reduction in accidents also.

Get a Planned Street Lighting Program

ABOUT two years ago, at the request of municipal officials of Wilkinsburg, Pa., the Duquesne Light Company prepared a planned street-lighting program for the Borough. A survey of Wilkinsburg's existing street lighting and traffic conditions gives detailed information on the existing street lighting as well as what is needed to meet modern requirements. This program now serves as the official guide in making any lighting changes in Wilkinsburg.

Wilkinsburg officials have given preference to the streets of greatest traffic hazards at night. For instance, the William Penn Highway, Route 22, leading into Wilkinsburg has a long, steep grade, and many serious accidents have occurred there. This was the first street on which a major improvement was made. It has sharply reduced traffic accidents.

Good street lighting attracts shoppers, and shoppers mean dollars in merchants' cash registers. That is why many municipalities around Pittsburgh are improving the street lighting in business areas. Cheerful, safe, well-lighted streets definitely attract people who do more "window shopping" at night and purchase more from local merchants. Well-lighted streets stimulate progress, pride in the home town, and build good will for the municipal officials and civic leaders who made them possible.

"Whenever we make any changes in our street lighting—whether it is the installation of a single street light or the improvement of the street lighting on an entire street—we do it in accordance with the Planned Street Lighting Program prepared for us by the Duquesne Light Company. It has certainly produced excellent results for us," said George S. Siefers, Chairman of the Street Lighting Committee of the Borough of Wilkinsburg.

Peoria's Street-Lighting Petition Is Successful

IN the March issue of THE AMERICAN CITY appeared the article, "Peoria Petitions for Modern Lighting." Since then, we have been notified by Peoria's Special Street Lighting Committee that the petition movement was extremely successful, and that all petitions have been turned over to the Board of Local Improvements. The City Engineer is now working on the system layout, installation costs, and plans necessary for final approval. Peoria's citizens wanted improved street lighting by Christmas 1948, and, as a result of their determination and effort, they are going to have new mercury-vapor lighting.

Here at last!

SELF-STARTING

SELF-WINDING

SELF-ENERGIZING

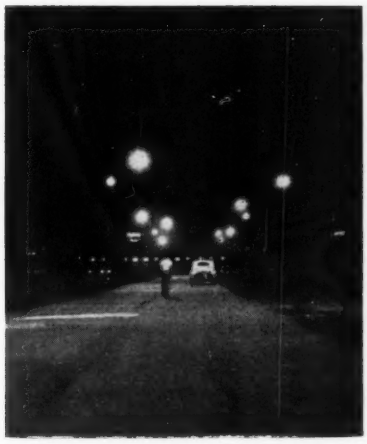
SELF-PROPELLED

*AUTOMATON

The Duncan Meter Corp. proudly presents this brilliant new addition to its line of Miller parking meters. After years of scientific study and research this truly amazing, actually SELF-WINDING parking meter is available for immediate presentation to your city.

Lighting Laboratory Includes a Full-Size Street

A laboratory technician is placing a street luminaire in this 20-sided room for tests. The white walls provide perfect light reflection.



This untraveled road on Cleveland's lakefront is Westinghouse Electric Corporation's outdoor lighting laboratory. Latest type lights are tested here.

AN INDOOR and outdoor lighting laboratory, with all the latest tricks for analyzing new lighting fixtures, is helping lighting experts of the Westinghouse Electric Corporation, Cleveland, Ohio, to design more efficient luminaires for street lighting.

Complete with the latest photometric equipment for determining light outputs, the laboratory even includes an untraveled, dead-end street on Cleveland's lake front. This street is actually a scientific street-lighting laboratory where the latest types of lights are hung as many as three deep on poles lining both sides of the pavement.

The new indoor photometric laboratory is another example of combining the latest in equipment and technique. In a darkroom large enough to hold a railroad locomotive, the walls, ceiling, floors, and furniture are painted black so that they will reflect no unwanted light during tests. In this midnight surrounding, the principal job is to measure accurately the brightness of new lighting units, their light distribution, the amount of heat they generate, their length of life under varying conditions, and many other factors important to engineers.

A new device to measure the light output of street luminaires includes a large mirror that can be moved in a giant circle around the street light being tested. Some 25 feet away stands a sensitive photocell to measure the light output in every direction, as the mirror is turned. Another part of the testing apparatus is a 10-foot-high box, shaped like a cut diamond, which is used to measure the total lighting efficiency of a luminaire after candlepower readings have been made from all angles. The box, called an icosahedron, opens like an Easter egg to reveal a small, 20-sided room painted snow-white. The white interior provides perfect light reflection, which is measured by a small photocell located in a window at one side of the shell.

From this laboratory, Westinghouse recently brought forth a new football-shaped street luminaire that uses a 400-watt mercury lamp, and an all-weather approach-light system for airports.

Extensive Street-Lighting Program in Chicago

CHICAGO took the first major step in its $8,000,000 street-light replacement and rehabilitation program with a recent order for 7,260 street lights, one of the largest contracts for luminaires ever awarded in this country. Installation of the new units will begin early this spring.

Approximately 4,200 of the electric luminaires will replace the gas and gasoline lights in the north, south, and central residential areas. The remaining 3,000 lights will be installed in districts heretofore unlighted.

These new 2,500-lumen lamps will spread light over a wider street area than before. The sealed fixtures are constructed with reflectors and prismatic globes, designed to distribute light evenly along the thoroughfare. Tapered steel poles will be set on one side of the street at 165-foot intervals. The lamps will be mounted 20 feet above the pavement, supported on 12- or 15-foot arms in order to clear the foliage. The greater lamp height reduces glare. Efficient servicing will be accomplished by tower trucks.

Lloyd M. Johnson, Chicago Commissioner of Streets and Electricity, estimates that replacement of 4,200 gas and gasoline lights with electric lamps would increase light output 500% and reduce cost $50,000 annually. It now costs the city $68 a year to maintain each gasoline lamp, but only $18 for each 250-candlepower electric unit.

Electric street lighting in Chicago dates back to 1887, when the city set up its own electricity distributing system. Under the new program, the city plans to buy the power for the new lights from the Commonwealth Edison Company, a Chicago utility. A new low rate for street lighting has been negotiated, under which small groups of street lights may be connected to the utility distribution system, instead of extending the present municipal power lines.

CROUSE-HINDS NEW

HIGH INTENSITY Runway Light

The Civil Aeronautics Administration recommends that all instrument landing runways be equipped with high intensity runway marker lights so the runways can be properly outlined to a pilot either day or night under conditions of poor visibility, such as fog, rain, or snow.

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Municipal and Civic Publications

Housing Statistics Explained

HANDBOOK OF HOUSING STATISTICS—*Office of the Administrator, Housing and Home Finance Agency. Available from Superintendent of Documents, Government Printing Office, Washington, D. C. February* 1948. 179 *pp. Tables, charts.* $1.00.

This volume presents an inventory of existing housing statistics drawn from more than 30 sources, including both government and private agencies. It is designed to promote agreement on housing data. The Handbook provides the most commonly used statistical material, with technical comment about the content and the method used in assembling it; points out the types of data which either are not available or which are scanty or imperfect for general use, and names the sources from which additional detail for continuing reports may be obtained.

Municipal Taxes in 1947

CITY TAX LEGISLATION IN 1947—*December* 1947 *issue of "Tax Policy." Tax Institute, Inc.,* 150 *Nassau St., New York* 7, *N. Y.* 12 *pp.* 25 *cents.*

This review of developments shows that the trend toward increased utilization of non-property taxes for municipal revenues, which got under way in 1946, continued apace in 1947. Because of the demands of cities for increased taxing powers, the states are granting them more and more leeway with respect to tax sources.

Cincinnati Street Construction

STREET CONSTRUCTION AND MAINTENANCE PRACTICE IN CONNECTICUT—*By the American Road Builders Association,* 1319 *F St., NW., Washington* 4, *D. C.* 35 *pp.*

A compilation of addresses presented at the forty-fourth annual convention of the American Road Builders' Association, held in Chicago in February 1947. Among others, it covers such subjects as the design of street-railway track area paving, street-car loading platforms, the use of pre-cast concrete steps, and the development of street-sewer inlets.

The pamphlet is illustrated and contains numerous interesting graphs.

Sanitation Report

ANNUAL REPORT, 1947 — *Interstate Sanitation Commission of New York, New Jersey, Connecticut,* 110 *Williams St., New York* 7, *N. Y.* 111 *pp.*

A complete, unabridged report, unlike the wartime summaries, covering the Commision's work in 1947. It includes six hearings, and urges municipalities to bring about a reasonable pollution-abatement program without recourse to the courts for reinforcement. In particular, the Commission condoned the use of the "by-pass" to protect sewage-treatment works, but insisted on more exacting control in the application of chlorine.

The report is mimeographed and has many charts and illustrations.

Rebuilding Central Areas

THE REDEVELOPMENT OF CENTRAL AREAS—*Ministry of Town and Country Planning, Great Britain. Summer* 1947. 100 *pp. Available from Sales Department, British Information Services,* 30 *Rockefeller Plaza, New York* 20, *N. Y.* $3.65.

The first in a series of advisory handbooks to be published by the British Ministry of Town and Country Planning dealing with the technique of planning. This volume is concerned with the more important technical problems involved in the redevelopment of central areas, and provides general guidance on the principles and standards that should govern the preparation and execution of a development plan.

The book is attractively illustrated and has clear multi-colored maps and charts. Some of the photographs of models of buildings and areas are specially interesting, such as the sequences, "Alternative Ways of Redeveloping an Office Area," and "Street Block Redevelopment in Stages." Written in a clear, easy-to-understand style, the book's exposition of redevelopment principles and objectives will be found of value to American planners and officials.

Plan for Rebuilding

WESTERN ADDITION DISTRICT REDEVELOPMENT STUDY—*By Mel Scott. San Francisco City Planning Commission,* 100 *Larkin St., Civic Center, San Francisco* 2, *Calif. November* 1947. *Mimeo. Illus.* 74 *pp.*

An excellent, comprehensive redevelopment study of a specific area in San Francisco. The over-all point of view adopted and the methods of analysis should be of general interest.

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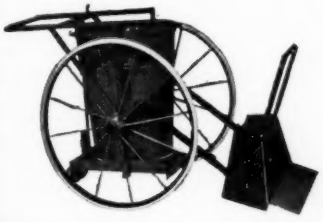

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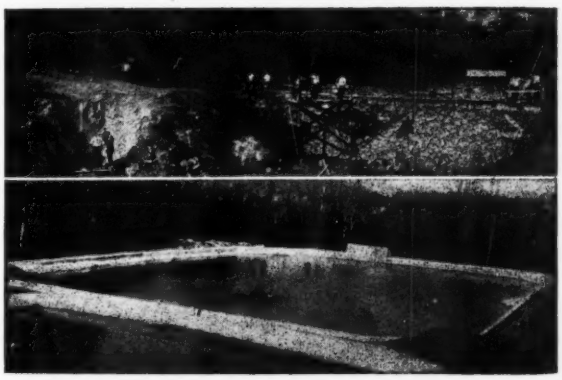

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Ammonium Aluminum Sulfate $Al_2(SO_4)_3 \cdot (NH_4)_2SO_4 \cdot 24H_2O$ *(Ammonia Alum) (Crystal Alum)*	Lump Nut Granular Powdered	11.2% Al_2O_3	Bags Fibre Drums	Coagulant for water. Advantageous for pressure filters. Supplies ammonia for chloramine formation. 1% Sol. pH 3.5.
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Sodium Silicate $Na_2O \cdot X(SiO_2)$ plus H_2O *(Water Glass) (Silicate of Soda)*	Viscous Liquid	38° to 52°Be. Various Ratios of $Na_2O:SiO_2$	Drums Tank Cars Tank Trucks	1. Aid in floc formation. 2. Prevent red water corrosion in distribution lines. 1% Sol. pH 12.7
Sodium Thiosulfate $Na_2S_2O_3 \cdot 5H_2O$ *(Hypo) (Sodium Hyposulfite)*	Crystals: Prismatic Rice Selected Universal Granular	99.75% $Na_2S_2O_3 \cdot 5H_2O$	Bags Barrels Fibre Drums	Antichlor. Water solution is neutral.
Sulfuric Acid H_2SO_4 plus H_2O *(Oil of Vitriol)*	Corrosive, oily liquid Various strengths	66°Be. (93.19% H_2SO_4)	Bottles Carboys Drums Tank Trucks Tank Cars	1. Reduce pH and alkalinity. 2. Regenerate carbaceous zeolites and ion exchangers. 3. Activate Baylis Silicate.
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Local Traffic Courts

PEOPLE'S COURT—*By Edward C. Fisher. Published by The Northwestern University Traffic Institute, 1704 Judson Avenue, Evanston, Ill.* 1947. 164 *pp.* $3.00.

This book should be required reading for police chiefs, traffic officers, municipal court judges, and others concerned with the functions and responsibilities of traffic courts. It is an excellent, clearly presented discussion of modern traffic-court theory and practice. Written from the standpoint of a judge with nine years' experience in the Municipal Court of Lincoln, Nebr., the book's emphasis is upon the court as an agency of all the people and upon the court's relation to the public.

While directed primarily toward various aspects of traffic cases, the book is by no means devoted exclusively to that type of work. Much of it applies to the activities of the inferior courts as a whole, and offers suggestions for judges, prosecutors, police, and certain others within the scope of the court's operations.

There are separate chapters on fines and penalties, violator types and their stories, and the drunken driver. The relationships of the court to safety organizations, lawyers, reporters, and the average citizen are also discussed in separate chapters. The appendix contains several sample forms and reports, a "non-fix ordinance," and a bibliography.

Airport Approach Zoning

AIRPORT APPROACH ZONING IN COLORADO—*By Allen E. Pritchard, Jr. Colorado Municipal League, 327 Norlin Library, Boulder, Colo. December* 1947. *Mimeo.* 36 *pp.*

A study of the factors and procedures involved in zoning to control airport approaches. The report points out that many municipalities have invested large sums of money in airport facilities and look to future traffic to produce a fair return on that investment. Although many fields have not experienced an encroachment upon their boundaries by possible hazards, it declares, such will, no doubt, be the result of increased airport use. Uncontrolled building in the immediate vicinity of airports will assuredly result in interference with airport approaches, decrease in traffic, and consequent loss of investment. The report is designed to help municipalities forestall such losses.

Canadian Planning Suggestions

PLANNING SUGGESTIONS FOR CANADIAN COMMUNITIES—*By John Bland. Field Service Department, the Canadian Chamber of Commerce, 530 Board of Trade Building, Montreal 1, Canada.* 1947. 64 *pp.* $1.50.

Aimed primarily at assisting citizen groups in smaller Canadian towns to come to grips with their local planning needs, this publication is a down-to-earth analysis of town planning, how it works and what it achieves.

Undoubtedly, this easy-to-read publication will be widely distributed among Canadian municipalities, civic organizations, and schools. It is hoped that it will encourage groups and organizations, particularly students, to make surveys of the conditions under which they live and work, and to become conscious of the different aspects of their environment. The booklet is further proof of the impetus with which Canadian citizen support for public planning is being marshalled.

New Publication for Connecticut Municipalities

CONNECTICUT GOVERNMENT—*Institute of Public Service, University of Connecticut, Storrs, Conn. Vol.* 1, *No.* 1. *January* 1947. 6 *pp. Subscription,* $1.00 *per year.*

This new quarterly digest of events of interest to officials and employees of towns and cities in Connecticut features a listing of the professional organizations in the state with which municipal officials can affiliate. It also contains news notes of various municipal activities.

Mississippi Housing

HOUSING FOR MISSISSIPPIANS—*By Vernon Davies. Bureau of Public Administration, University of Mississippi, University, Miss.* 1947. 41 *pp.*

This study, the first in the Sociological Study Series, investigates the housing situation in Mississippi by noting some of the factors leading up to the current shortage; making a survey of housing needs in the state as shown in the census and other reports; summarizing available information on post-war housing developments, and outlining some of the problems that are likely to arise in connection with any program designed to increase the quantity and improve the quality of Mississippi dwellings.

The report points out that among the problems which will confront the Mississippi Legislature in its next session, few are more acute in the state today than housing. The study is a good example of the way in which a state university can expand its services.

Regionalism

CITY REGION AND REGIONALISM—*By Robert E. Dickinson. Oxford University Press,* 114 *Fifth Ave., New York* 11, *N. Y.* 1947. 327 *pp.*

This volume, "a geographical contribution to human ecology," reflects growing British interest in ecological study, which, evidently, has been relatively neglected up to now in Great Britain.

The book is "concerned with certain aspects of the geographical structure of society upon which planning must be based, and it insists that knowledge of the anatomy of society must precede the treatment of its defects." It discusses the organization of both small and large urban areas as centers of human activity and organization in the service of surrounding tributary areas.

It will be found of interest to sociologists and planners in the country concerned with basic geographical foundations for planning.

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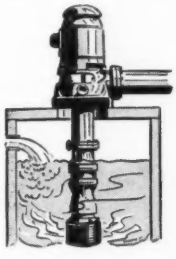

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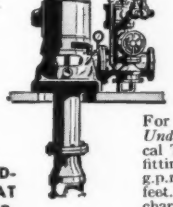

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Planning Standards

PLANNING STANDARDS—*Three manuals prepared by the Sacramento City Planning Commission. No. 1, Streets and Subdivisions; No. 2, Parking; No. 3, Setbacks and Zoning by Design. Available from the Commission, Room 308, City Hall, Sacramento 14, Calif.* 1947. *75 cents per manual or $2.00 per set, plus sales tax of 2½% in California only.*

These are working manuals, consisting mainly of letter-head-size drawings and charts, with only a small amount of explanatory text. The booklets include some of the best standard planning practices that have appeared in other publications in addition to original standards prepared by the Commission.

Some of the standards may be made mandatory by City and County Ordinances such as those for street design, lot sizes, building setbacks, requirements of off-street parking and zoning. Other standards are guides to good practice, including suggested freeway designs, parking, area layouts with relative cost estimates, subdivisions with shopping-center plans and land-use estimates.

The manuals were intended chiefly for the use of the Sacramento Metropolitan Planning Committee, composed of four official planning agencies, in two cities and two counties. They have now been made available to the general public as a means of promoting interest in and understanding of planning.

Personnel Administration In Small Jurisdictions

SMALL GOVERNMENT CAREER SERVICE, A MANUAL FOR MARYLAND—*By Claire Bracken. Bureau of Public Administration, College of Business and Public Administration, University of Maryland, College Park, Md.* 1948. *56 pp.*

This booklet is a discussion of personnel administration with main focus on the problems of small local governments in Maryland.

Baltimore's Welfare Procedures

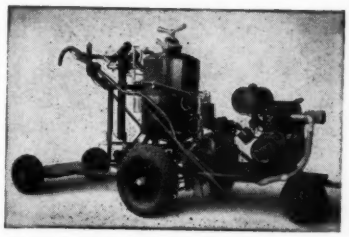
THE DEPARTMENT OF WELFARE, CITY OF BALTIMORE—*A Study by the Commissionon Governmental Efficiency and Economy, Inc., Mercantile Trust Building, Baltimore, Md. December* 1947. *84 pp.*

This comprehensive study is an excellent example of independent citizens' research into a municipal department's operation and procedures. The study was made at the request of the mayor of Baltimore and officials of the Department of Welfare itself. The recommendations should be of general interest and value to municipal officials and welfare departments in other cities.

Liverpool's Centennial

CITY OF LIVERPOOL, A CENTURY OF PROGRESS, 1847-1947. *Three pamphlets. "Public Health," "Public Works" and "Water Supply." Available from Town Clerk's Office, Municipal Buildings, Liverpool 2, Great Britain. February* 1948. *Illus. 24 pp. each. 50 cents each postpaid.*

These three interesting and attractive brochures were published by the City of Liverpool to celebrate its centenary. They describe how the services offered by the various municipal departments have improved and expanded over the years. The brochures may be of interest to students of local government who are considering the comparative development of public services.



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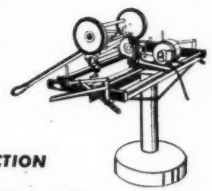

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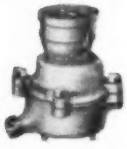
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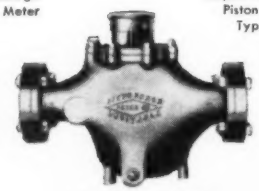
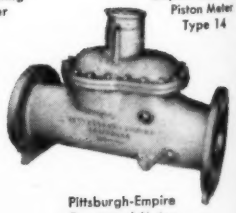

Pittsburgh Eureka "B" Meter, Current Type


Pittsburgh-Empire Compound Meter Single Register Type

Negro Housing Needs

NEGROES AND THE HOUSING CRISIS, 1947—*Summary prepared by Office of Field Services, National Urban League, 1133 Broadway, New York 10, N. Y. February 1948. Mimeo. 7 pp.*

This report presents very clearly the seriousness of existing housing conditions for Negroes in municipalities throughout the country. It indicates the need for a concerted attack on the problem from many different angles.

Other Reports Received

CHICAGO, ILL. — Annual Appropriation Ordinance of the City of Chicago, 1948. 176 pp. 10 cents in postage. Available from the Municipal Reference Library, 1005 City Hall, Chicago, Ill.

COOKE COUNTY, ILL.—Annual Message of President of Board of Commissioners and of Board of Forest Commissioners, 1947. Illus. 312 pp. 10 cents in postage. Available from the Municipal Reference Library, 1005 City Hall, Chicago, Ill.

HARTFORD, CONN.—Viewpoints on Planning and Zoning. As expressed at the 22nd Annual Planning and Zoning Clinic, November 1947. Sponsored by the State of Connecticut Development Commission, State Office Building, Hartford. Illus. Mimeo. 27 pp. December 1947. Mimeo. 3 pp.

MONROE, N. C.—Employment Code. By the Board of Aldermen of the City of Monroe. Mimeo. 2 pp.

NASHVILLE, TENN.—Eleventh Annual Survey of County, City, and Town Government in Tennessee. 1946. Conducted by Tennessee Taxpayers Association. Tables. Charts. Mimeo. 112 pp.

NEW YORK, N. Y.—A Better Government for a Better City. A Study of Five Departments of the City of New York, at the request of the Hon. William O'Dwyer, Mayor. Citizens Budget Commission, 51 East 42nd St. 1948. Tables. Charts. 488 pp.

NEW YORK, N. Y.—Landfills and Their Inspection. By Richard Fenton. Bureau of Sanitary Engineering, Department of Health, 125 Worth St., New York City. 1947. Mimeo. 10 pp.

QUEBEC, CANADA — Statistical Yearbook, 1947. By the Bureau of Statistics of the Province of Quebec. Charts. Tables. 615 pp.

UNIVERSITY, MISS.—A Handbook of Mississippi State Agencies. By the Bureau of Public Administration. University of Mississippi. University. 1948. 191 pp.

UNITED STATES — Current Population Reports, January 1948. By the Department of Commerce, Bureau of the Census, Washington, D. C. Maps. Tables. 9 pp.

UNITED STATES—State Finances, 1946. Compendium. By U. S. Department of Commerce, Bureau of the Census, Washington, D. C. Tables. 58 pp.

VANCOUVER, CANADA—The Major Street Plan. By Vancouver Town Planning Commission. Vancouver, British Columbia. 1947. Tables. Maps. Illus. 86 pp. $1.00.

Planning and Housing Reports

BROOKLINE, MASS. — Annual Report on Long Range Planning, 1947. By the Brookline Planning Board. Tables. Charts. Mimeo. 24 pp.

HARRISON, N. Y.—A Town Plan. By the Technical Planning Association, Inc., New Haven, Conn. 1947. Colored maps. Illus. 8 pp.

INDIANAPOLIS, IND.—Operation Housing, The American Legion Community Programs for Veterans. By the National Headquarters, The American Legion, 777 N. Meridian Street, Indianapolis 6, Ind. 15 pp.

MORRIS PLAINS, N. J.—A Comprehensive Plan for the Borough of Morris Plains. Prepared for the Borough Planning Committee by Scott Bagby, 22 Pleasant Avenue, Montclair, N. J. 1948. Charts, Tables, Maps. Mimeo. 39 pp.

NETHERLANDS—Some Facts About Housing and Town Planning in the Netherlands. Compiled by the Information Service of the Ministry of Reconstruction and Housing, The Hague, Holland, November 1947. Maps. Illus. 23 pp.

ORANGE, N. J.—Progress Report, 1947. By the Orange Planning Board, City of Orange. Charts. Maps. Mimeo. 20 pp. $1.00.

PHILADELPHIA, PA.—Recommended Program of Public Improvements, 1948-1953. By the Philadelphia City Planning Commission, Market and Juniper Streets. Charts. Tables. Maps. Illus. 154 pp.

PONTIAC, MICH.—A Master Plan for the City of Pontiac. By the City Plan Commission, Pontiac. December, 1947. Mimeo. 31 pp.

UNITED STATES—Projects and Publications of Interest to Planning and Development Agencies. By the U. S. Department of Commerce, Office of Domestic Commerce, Washington 25, D. C. February, 1948. 17 pp.

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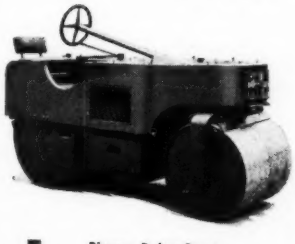
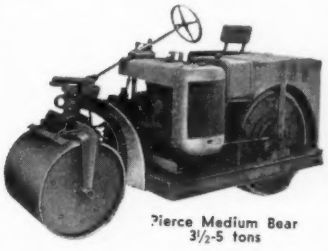
A Roller For Every Job

Sturdy, heavy-duty rollers, engineered to stand up under the toughest conditions. Pierce-Bear Tandem Rollers are powered by economical Allis-Chalmers 4-cylinder industrial type gasoline engines. Variable weights, from 3½ to 5 tons with built-in water tanks for ballast and wet rolling.



Pierce Baby Bear 2½-3 tons



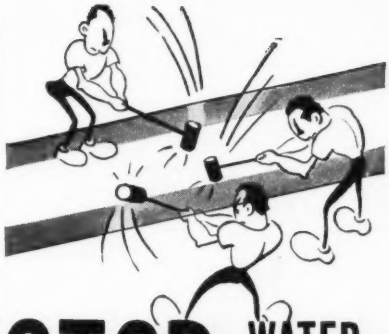
Pierce Medium Bear 3½-5 tons

The new 2½-3-ton Pierce Baby Bear is designed for close-in work and small area maintenance. It works against a curb up to 25 inches high and within 1½ inches of a higher wall or building. Final drive is within the rear roll. Use Pierce-Bear Tandem Rollers for all-around performance. Write for folder.

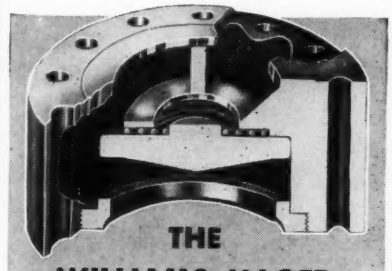
Pierce-Bear Rollers

Lewis Manufacturing Co.

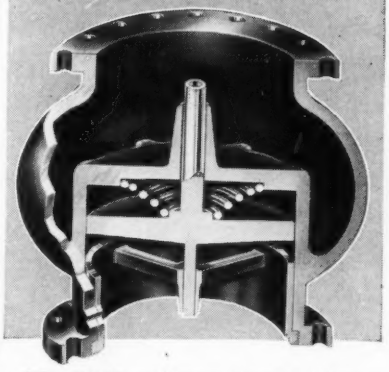
415 Hoefgen Ave.—San Antonio 6, Tex.



STOP WATER HAMMER



THE WILLIAMS-HAGER *flanged* SILENT CHECK VALVE



The Williams-Hager Flanged Silent Check Valve is available for every service . . . bodies of Iron, Semi-Steel, Cast Steel, Government Bronze, Stainless Steel or Monel Metal . . . fitted with seats and discs of either Government Bronze, Stainless Steel or Monel. Standard sizes from 1 inch to 20 inches. *Write for new technical bulletin.*

THE WILLIAMS GAUGE CO.

Pump Valves . . . Water Gauges . . . Gauge Cocks . . . Steam Traps . . . Pump Governors . . . Feed Water Regulators . . . Water Columns

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PIPE LINING FACTS

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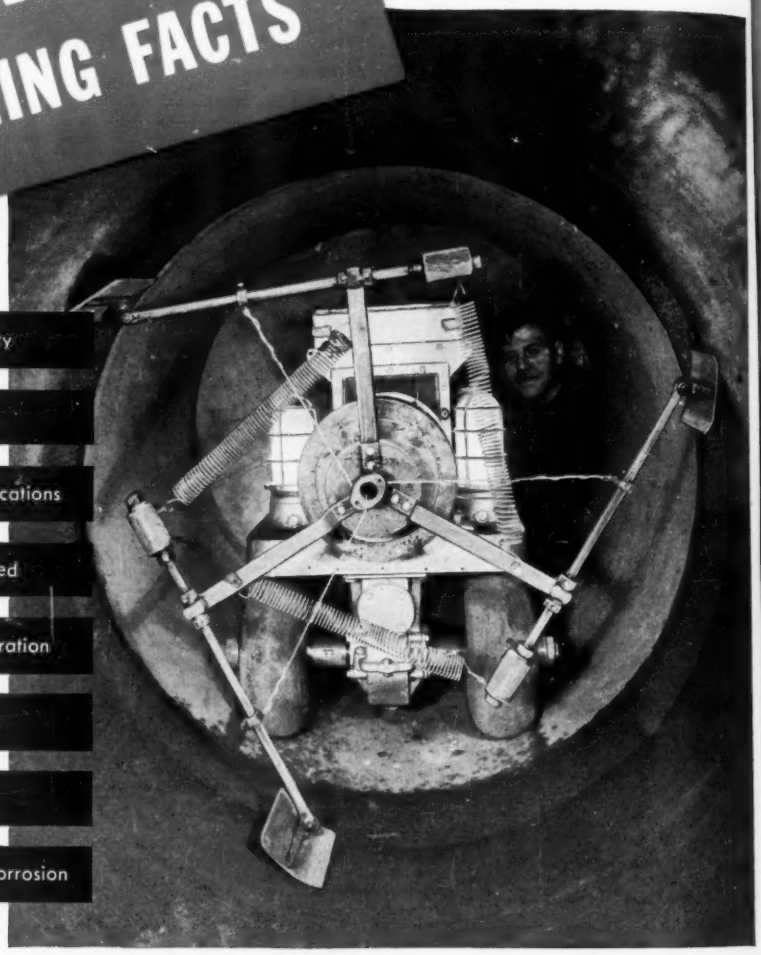

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5. Prevents leakage due to exterior penetration
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If mains are losing their efficiency or if new mains are planned you should consider Centrilining. Our new bulletin will tell you the many advantages of the Centriline Process . . . better still, we suggest you consult our competent staff of hydraulic engineers.

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News and Illustrations

Items of interest to city, town and county officials and others concerned with the economical construction and efficient operation of public improvement undertakings

Water Hammer— Its Cause and Control

By J. A. HAGER
Williams Gauge Co.
Pittsburgh, Pa.

The control of water hammer depends on the speed that the valve disc of the check valve can be brought to the valve seat. This must take place before the water, sewage, or whatever is being pumped reverses flow.

Water hammer, besides being nerve-racking, is dangerous to the lives of employees whose duties require their presence where this condition exists. Water hammer has wrecked equipment, broken boiler feed lines, flooded engine rooms, damaged water meters, and loosened calking in the water mains.

To determine the effect of water hammer measured in pressure built up when the check valve closes after a pump shuts down, the Factory Mutual Laboratories, Associated Factory Mutual Fire Insurance Companies testing department of Boston, conducted a test using an electrically driven centrifugal pump delivering water at a pressure of 85 pounds through a 6-inch pipe. With a swing check valve in the line, the water exerted a pressure of 95 pounds on the pump side of check when the valve closed.

It is easy to imagine what 470 pounds' force would do to equipment and fittings over a period of time. It is this continuous concussion which causes damage to water meters and calking in water mains.

Many devices have been tried to control water hammer—dash pots, bypass valves, air chambers, counter weights, and shock absorbers. All of these methods were designed to take care of the hammer after it had occurred instead of preventing the occurrence.

The ideal method of water-hammer control would be to have a simple check valve without complicated adjustments, no dash pots to bind or wear, no orifices to become clogged with scale or sand, and no air chamber to become waterlogged. The Williams-Hager check valve fulfills all of these requirements, as it is simple, needs no adjustments, cannot clog with scale or sand, and is noiseless in any position or service.

If we stop for a moment to study what takes place in a line when a pump shuts down, we will find that the action and reaction of a column of water after a pump shuts down can be compared to the action and reaction of a weight thrown perpendicularly into the air.

It will be seen that if a check valve closes at a point when the column of water comes to rest, there will be no water hammer. By closing the check valve when the column of water is at rest, as it is for a fraction of a second before the reversal of flow takes place, no back flow force can be exerted —and without this force no water hammer can occur.

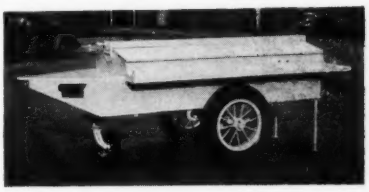
Furthermore, it has been proved by experience that the longer this reversal of flow is allowed to continue, the greater will be the force exerted when stopped. The momentum attained by the increasing velocity after reversal of flow governs the intensity of the force exerted when a check valve closes.

Williams-Hager check valves are silent because they are so designed that they close instantly when the column of water they control comes to rest and before a reversal of flow occurs after the pumping force is stopped.

Peerless Pumps Opens New York Office

A New York office to handle Atlantic district sales of Peerless Pumps has been opened at 37 Wall St., New York, N. Y., by the Food Machinery Corp. Sales in this district were previously handled at Ardmore, Pa. R. C. Engemoen has been appointed this office's district manager.

New Littleford All-Steel Tool Box



The HanDeeBox is an all-steel portable tool box with sliding shelves divided into compartments for holding all the tools required for a job. It is light weight, fireproof, weather-proof and thief-proof; the patented locking cover prevents tampering with the tools. Locking chains keep the box from being trailed, so the unit can be left on the job. A caster wheel permits moving the box on the job. The HanDeeBox is manufactured by Littleford Bros., Inc., Cincinnati, Ohio.

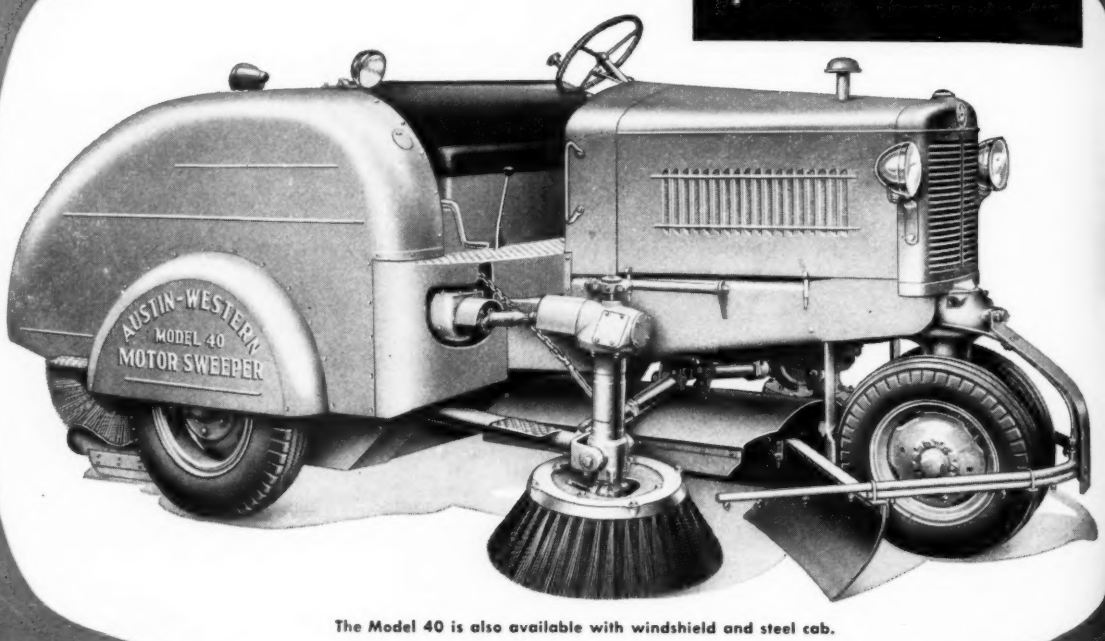
Good for Trees

A new concentrate and dust applicator for shade-tree treatment has been developed and is now offered for use by the John Bean Mfg. Co., Lansing 4, Mich. The unit is on a bedplate 100 feet vertically, the machine's five nozzles in the delivery end of the discharge outlet distribute liquids, dry dust, a combination, or wet dust. The for mounting on a truck or tractor. With a range of 150 feet laterally and method is to displace the air in and around the tree with air containing the liquid or dust particles.

The 29-inch fan discharges 20,000 cubic feet of air per minute at 90 miles an hour. A separate blower shears off the liquid by delivering an air stream of 150-mph velocity. The concentrate tank holds 50 gallons; the dust hopper holds 100 pounds. The Rotomist is 6 1/6 by 4 1/3 feet by 4 2/3 feet high.

Get Superlative Performance with

The Model 40 MOTOR SWEEPER



The Model 40 is also available with windshield and steel cab.

These 11 features *(many of them exclusive)* are responsible for its ability to OUTPERFORM

2-yard Hopper, with flushing device and hydraulic control.

36-inch, bump-proof, oscillating gutter broom, with tilt and pressure adjustments.

NO CONVEYOR — the 5-foot, gear-driven, rear broom sweeps directly into the hopper.

7-foot sweeping width with one gutter broom (right-hand or left-hand).

9-foot sweeping width with 2 gutter brooms, for one-way streets and large areas.

Load can be transported any desired distance.

3-wheeled design, with full maneuverability and front-mounted motor.

Handles like a truck, for simplicity, visibility and public safety.

Steep grades are no problem, with positive drive to both rear wheels.

Dumps to the rear and resumes sweeping in less than a minute, without backing or leaving path of travel.

Leaf Broom attachment provides fast, efficient removal of leaves.

AUSTIN-WESTERN COMPANY, AURORA, ILLINOIS

BUILDERS OF ROAD MACHINERY

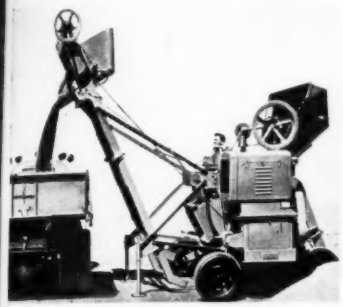
Austin Western

SINCE 1859

Discharge Mix Directly into Truck

A special tower attachment for discharging a bituminous mix above the ground level has been introduced by the Kwik-Mix Co. of Port Washington, Wis., subsidiary of the Koehring Co., Milwaukee, Ill.

The Kwik-Mix tower is adaptable to either the 10-cubic-foot or the 14-cubic-foot standard bituminous mixer and it enables truck loading or stock-



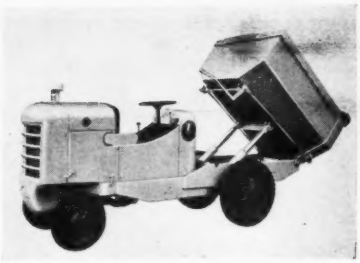
piling at discharge heights of 7¾ and 8¾ feet.

Fully controlled by a single lever located on the operator's platform, the hoist is mounted in the mixer frame and powered by the mixer motor. The hoist clutch is disengaged automatically when the bucket reaches the discharge position. The tower can be collapsed quickly and positioned for ample road clearance when the machine is moved from one location to another.

Hough Payloader Buggy Has 2-Cubic-Yard Capacity

The Payloader Buggy, a companion of the Hough Payloader Shovel, is a gasoline-engine-powered, four-wheel, pneumatic-tired hauling unit with a 2-cubic-yard capacity, hydraulically dumped body, and main parts which are interchangeable with those of the Hough Model HA Payloader Shovel.

Built with a short wheelbase and rear-wheel steer so that it can operate in congested low-headroom areas and through narrow doorways and aisles,



the Payloader Buggy has an over-all height of 5 feet 8 inches. It has two forward and two reverse speeds. The Payloader is manufactured by The Frank G. Hough Co., 710 Sunnyside Ave., Libertyville, Ill.

CUT TALL GRASS... WEEDS...BRUSH
Faster and Easier

Ideal for water works, sewage plants, parks, playgrounds, airports, roadsides, vacant lots, tourist camps. Mows fast and clean around buildings, trees, and fences.

Very easy to handle on rough ground, steep slopes or hard to reach places. Cuts 1½" from ground. Does work of 8 men.

EASY TO LOAD

Light weight of JARI makes it easy for one man to load into truck or car trunk for quick moving. Rugged. Dependable.

WRITE TODAY FOR *FREE* FOLDER

JARI PRODUCTS, Inc.
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MINNEAPOLIS 8, MINNESOTA

"Big Machine"
STAMINA
"Little Machine"
MOBILITY

It's the
NELSON
K-5

TOUGH jobs on the road and tight spots in the yard never stymie a Nelson K-5. Watch this nimble loader as it responds sensitively to operator's touch. Here's *toughness* for the pit or road—plus *agility* for the busy yard. Here is that rare combination of ruggedness and flexibility that you've been looking for.

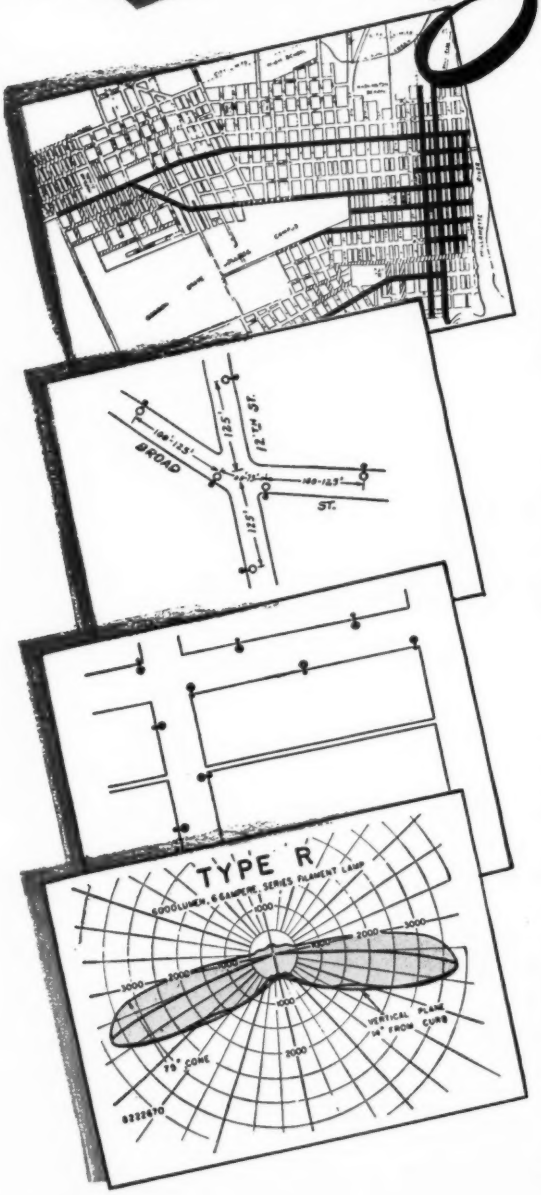
More, a Nelson K-5 is economical to buy and economical to operate. Watch it do hard work the easy Nelson way, "picking before it shovels."

Other features include two-strand elevator . . . Twin Disc clutches . . . four-speed transmission . . . self-steering tow bar for quick, easy movement between scattered jobs.

Use a Nelson K-5 for quicker, lower cost loading. Watch it run circles around bulkier, less responsive machines. Write for details and prices.

NELSON
N. P. NELSON IRON WORKS, INC.
CLIFTON, N. J. • *Truck Loaders Since 1917*

when you plan Street Lighting



Use this GE service, available to all progressive communities

Whether you are considering replacing a major portion of your street lighting system—or the lighting of a single street or of an intersection with an accident record—it will pay you to *plan* the installation with the aid of General Electric lighting specialists. For unless your existing equipment is really modern, you will not get either the best in lighting or the most in efficiency by simply extending your present system.

Street lighting, like other engineering sciences, has progressed a long way since the majority of present systems was installed. Authorities are recommending more light, better controlled light, as automobile speeds increase. Modern luminaires do this job with more light per dollar than older types of equipment.

DETAILED PLANS FOR YOUR PROBLEMS

General Electric Lighting Specialists will be glad to assist you in planning any street lighting installation. These Specialists, located in G-E offices throughout the country, are ready to help public officials—in collaboration with the electric utility company, if one is involved—to work out requirements for a single corner or for an entire city. They are backed by the Illuminating Laboratory at Schenectady, and will consult with this organization on any unusual problems.

AVAILABLE WITHOUT COST

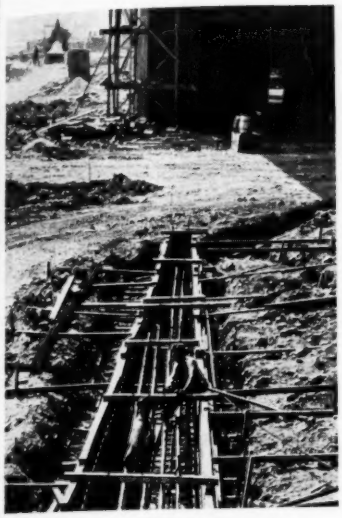
This service is available without cost through the nearest General Electric office. It is of top professional quality. It is offered by the company that makes every type of light source and luminaire that is economically feasible for any street-lighting job—a company that is therefore sincerely interested in seeing that users get equipment that best meets their needs. *Apparatus Department, General Electric Company, Schenectady 5, N. Y.*

Typical pages from a recent street-lighting survey, prepared by General Electric, show lighting plans for a downtown street, for a particularly hazardous intersection, and light distribution characteristics of recommended luminaires.

GENERAL ELECTRIC

452-46-3010

Hot Water Makes Airstrip Iceless



The first snow-melting system of any kind to be installed at an airport features the entryway of a large new hangar at Chicago for American Airlines. A system of wrought-iron pipes, manufactured by the A. M. Byers Co., Pittsburgh, Pa., is embedded in the provement beneath the doors of the hangar. These pipes carry hot water, with anti-freeze added, and keep the surface temperature above the freezing level. Thus a strip remains clear of snow and ice throughout the "Windy City's" winter months.

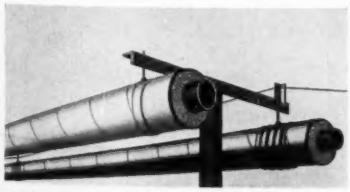
International Harvester's Purchase

The principal stock ownership of the Metropolitan Body Co., Bridgeport, Conn., has been purchased by the International Harvester Co., 180 N. Michigan Ave., Chicago 1, Ill.

Metropolitan Body has supplied International Harvester with special types of bodies for its lighter-model motor trucks for many years. Metropolitan will be operated as a wholly-owned subsidiary of International.

Ric-wil Foilclad Pipe Units

An exclusive feature of the recently developed Ric-wil Foilclad pipe units for overhead distribution of oil, viscous

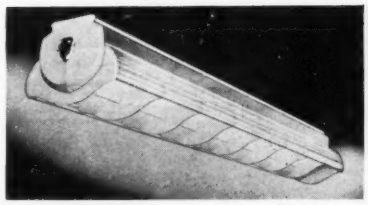


fluids, process liquids and steam, lies in the fact that pipe in these units is insulated at the factory to meet individual project specifications. Foilclad units are shipped in 21-foot sections, completely prefabricated of asbestos, cork, or other insulation as specified. Following insulation, the pipe is coated with high-temperature asphalt and tension wrapped with asphalt-saturated asbestos felt. A second coating of asphalt is followed by a tension wrapping of aluminum or copper foil which forms a bond with the asphalt. The result is a durable unit, waterproof and weather-protected.

A variant of the basic type of Foilclad unit employs a pipe supported within a pipe, with insulation round the outer pipe so that any desired temperature can be maintained within the pipes. Either pipe can carry the process fluid, while the other carries the heating or cooling medium.

Detailed information may be obtained by writing to Dept. 1182B of the Ric-wil Co., Cleveland, Ohio.

Plastic Fluorescent Lamp

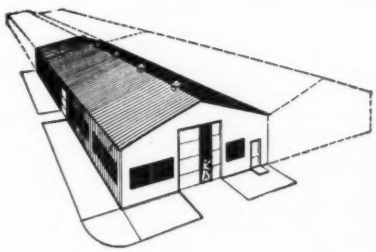


An all-plastic commercial fluorescent louver which eliminates eye-tiring surface brightness contrast is announced by Holdenline Co., Cleveland. Said to be first of its type, it employs no metal restraining parts. All-plastic construction eliminates objectionable dark-to-bright surface contrasts.

STANDARD PRODUCTION BUILT UNITS

Available in basic unit widths 40′, to 100′ clear span.
Length adjustable in increments of 20′.
Clearance at eaves 12′ to 20′.
Unlimited width through multiple unit system.

NOW IN PRODUCTION



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Yes! YOU CAN BUY THE BEST PARKING METER FOR THE LOWEST PRICE

MI-CO

SEE REGULATIONS ON OTHER SIDE
INSERT ONE COIN AT A TIME
TURN HANDLE TO STOP AFTER EACH COIN
FREE PARKING ON SUNDAYS
MI-CO METER

Here are 10 reasons why . . .

1 Ten years of parking meter building experience with installations in all sections of United States and in Canada, operating under all climatic conditions.

2 Minimum number of parts cuts manufacturing costs.

3 Only the finest, non-corrosive materials are used in MI-CO construction.

4 Any timing combination you may require.

5 Easy to service . . . right on the street.

6 Maximum productive time—MI-CO's are seldom out of order.

7 Unusually low maintenance.

8 Simple, rugged construction means smoother operation, and less servicing.

9 Competitive and engineering tests give MI-CO Meters the highest possible rating.

10 MI-CO Meters have all the features required, plus other advantages.

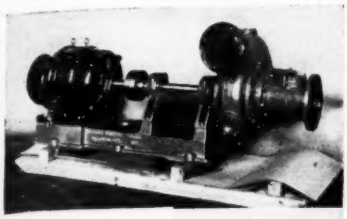
DON'T TAKE CHANCES!

Choose the dependable MI-CO Parking Meter . . . the Best at the Lowest First Cost, and the Lowest Maintenance Cost. Write for further details, and case histories.

MI-CO METERS, 231 Court St., Covington, Ky

Division of The Michaels Art Bronze Company

Centrifugal Pumps For Sewage Plants



The horizontal pump.

The vertical pump.

The Morris Machine Works, Baldwinsville, N. Y., manufactures a line of heavy-duty, non-clogging centrifugal pumps for use in sewage plants which are expressly designed to pass large solids. The castings are heavy and the pumps are mechanically and hydraulically designed to withstand abrasion.

Both horizontal and vertical pumps are available in sizes 3 to 20 inches, adaptable to all types of drives. Hand holes are provided both in the casing and in the suction nozzle, and the pumps are easy to dismantle. The pumps are designed to withstand abnormal operating conditions encountered in service, such as the closing off or the choking of the suction line, the occasional handling of air, the handling of excessive quantities of grit, and the pumping of long, stringy, and fibrous materials.

Sewer Cleaning Units With Air- or Water-Cooled Engines

The Turco Maxi-Power sewer-cleaning units (two power winches to each unit) in the four, three, and two models completely cover the wide range of municipal requirements. According to the manufacturers, the Maxi-Power units are the perfect combination of the finest modern materials. For proof, they give the following major points in the specifications of the Maxi-Power units:

The chassis frame is fabricated from 2¼-inch diametered heavy-gage seamless steel tubing to give structural strength in all directions and to eliminate useless dead weight. The hoist is mounted on a separate frame of welded structural members.

The cable drum is a weldment with capacity to hold in excess of 1,500 feet of ⅜-inch cable or 1,000 of ½-inch. Perfect alignment of the cable is achieved by a special clamp to avoid kinks and bulges.

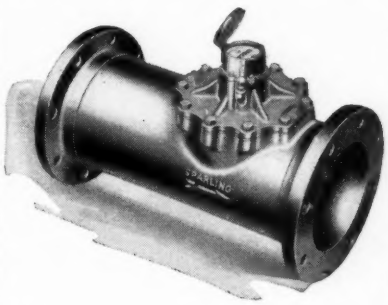
The completely dust-proof gear-box houses gears that are machine-cut from heat-treated alloy steel forgings. The gears run on oil and are mounted on shafts that operate on self-aligning, ball-bearing flange units.

Three-speed heavy-duty transmission, with built-in clutch, produces operating speeds from 33 to 121 feet per minute with ease and safety.

Cable level-winding is assured by the designed features of the traveling sheave and the cable angle to the drum.

The Turco Maxi-Power units are manufactured by the Turbine Sewer Machine Co., 5210 W. State St., Milwaukee, Wis., and are completely described in the company's catalog 8A (Maxi-Power Edition), which covers the wide range of municipal requirements.

SPARLING MAIN-LINE METERS



A Money-Saving Suggestion for you!

HAVE your men install Sparling Meters on each of your distribution mains. Then you will *know* exactly how much water goes to each section of the city!

Total the service meter readings monthly on each section and compare with the Sparling registers. As long as the two totals agree closely, O.K. If there is an appreciable loss, you have narrowed down the area to be investigated.

Statistics show that losses *per mile* of main may run to 40,000 gallons a day! The first step toward saving your treated water is to meter your main-lines.

If Totalization is all you need, no instrumentation is needed with Sparling Meters. Flow-rate indication and recording are optional.

Quotations gladly given. Bulletin 310 comes upon request.

R. W. SPARLING
Manufacturers of WATER MEASURING EQUIPMENT

LOS ANGELES 54 ---- Box 3277 Terminal Annex
CHICAGO 16 ---------- 3104 South Michigan Ave.
622 Broadway ---------- CINCINNATI 3
101 Park Avenue ---------- NEW YORK 17
BOSTON 8 ---------- 6 Beacon Street

FOR CLEANER, SAFER
SHOWER ROOMS AND SWIMMING POOLS

"Bull Frog"
SAF-T-KLENZ

Developed specifically for removing rust stains, lime deposits, soap oil, body grease, algae formation.
Leaves floors and decks practically slip-proof.
Minimizes conditions that breed and spread infectious germs.
Simply sprinkle Saf-T-Klenz on damp surface, wait a minute or two, scrub or mop lightly, and flush with clear water.

WRITE TODAY FOR LIBERAL FREE SAMPLE!
BERMAN CHEMICAL CO., 715 SUPERIOR ST., TOLEDO 4, OHIO

24" Mono-Cast Centrifugal Pipe, 24" x 8" Tees and 8" Offsets installed as main air line of sewage treatment works.

MONO-CAST CENTRIFUGAL PIPE

RENDERS QUALITY SERVICE

In Water Works and Sewage Treatment Plants

The feeling of confidence that exists between the Acipco organization and that great body of men responsible for the development of water and sewage works in these United States is the result of many years of close cooperation. Since the beginning of our Company, Acipco has constantly worked hand in hand with engineers, contractors and superintendents in solving piping problems in their respective fields.

As always during the past, Acipco offers quality pipe and fittings plus experienced personal service of similarly high caliber.

Refer your next piping job to Acipco and utilize both our extensive manufacturing facilities and our nearly half a century of experience in furnishing pipe and fittings for water works and sewage disposal plants.

AMERICAN CAST IRON PIPE COMPANY

BIRMINGHAM 2, ALABAMA

11,300-Pound Air Cargo for El Salvador

In order to prevent an epidemic resulting from contaminated water when an engine in the El Salvador water-pumping plant broke down, this 11,300-pound Caterpillar diesel engine, said to be the largest unit of air cargo ever shipped, was flown to the Central American city. Here a Hyster truck loads the plane.

Pyrene Co. Recalls 500,000 Extinguishers

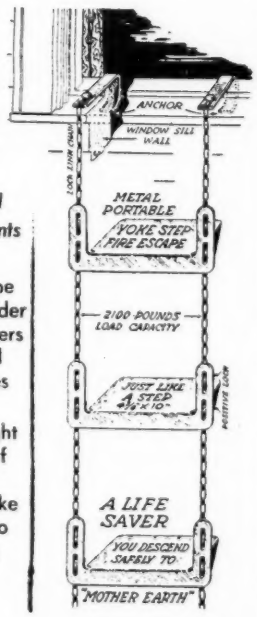
When a corrosive in the extinguisher fluid supplied to the Pyrene Mfg. Co., 560 Belmont Ave., Newark 8, N. J., by an outside manufacturer severely damaged some extinguishers and would probably affect others in time, the company called in more than half a million of its hand carbon tetrachloride fire extinguishers.

All extinguishers recalled are of the vaporizing liquid pump type. They are quart and 1½-quart sizes with the exception of a small number.

George H. Boucher, Pyrene vice-president, said the recalled extinguishers were mostly in industry and commerce and that probably only from 15,000 to 25,000 were in private homes. They are scattered throughout the country; nobody can say exactly where. The returned extinguishers will be repaired, refilled with proper liquid, and returned.

Universal Metal Ladder
"UNILAD"
TESTED APPROVED

Tensile Strength 2,200 Lbs.

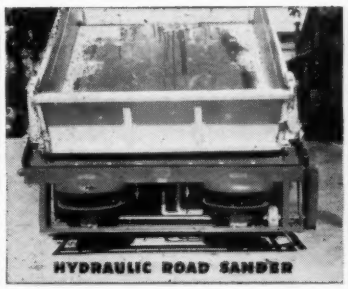


Universal Requirements

Fire Escape
Marine Ladder
Steel Workers
Industrial
Air Planes

Light Weight
Fire Proof
Strong
Positive Yoke Step — No Slipping

UNIVERSAL METAL LADDER CO.
Houseman Building
Grand Rapids 2, Michigan



Hydraulic Sander Gives

√ **Controlled Speed**
√ **Controlled Density**
√ **Controlled Direction**

City, county and state highway departments use Hydro Spreaders because they provide the safe, sure way of sanding icy streets and roads. Easily installed on any dump truck with hydraulic hoist.

Material can be spread from 9 ft. to 35 ft. at speeds up to 30 m.p.h. All sprockets and chains are fully enclosed and material can be dumped over spreader without damage. One man can drive truck and operate spreader from cab.

An exclusive Hydro Spreader feature is the automatic gate opening device. When the driver starts the spreader the gates open and as the spreader is stopped the gates automatically close. Immediate delivery.

Write for illustrated folder
Some Distributor Territories Available

Hydro Spreader Corp.
247 Madison St. Waukesha, Wisc.
Phone: Waukesha 8040

FISHER
M-SCOPE
ELECTRONIC
LEAK DETECTOR

'HAN-DEE' MIDGET DETECTOR LOCATES LEAKS PRECISELY

Why tolerate costly leaks in oil, water, sewage, and pressure lines . . . or waste enormous sums in blind exploratory excavating to find them? The M-Scope "Han-Dee" Midget Leak Finder, an inexpensive electronic instrument, is so sensitive that it can locate the exact trouble with pin-point accuracy . . . even through concrete.

$67.50
up delivered

Write today for **FREE** *16 Page Booklet*

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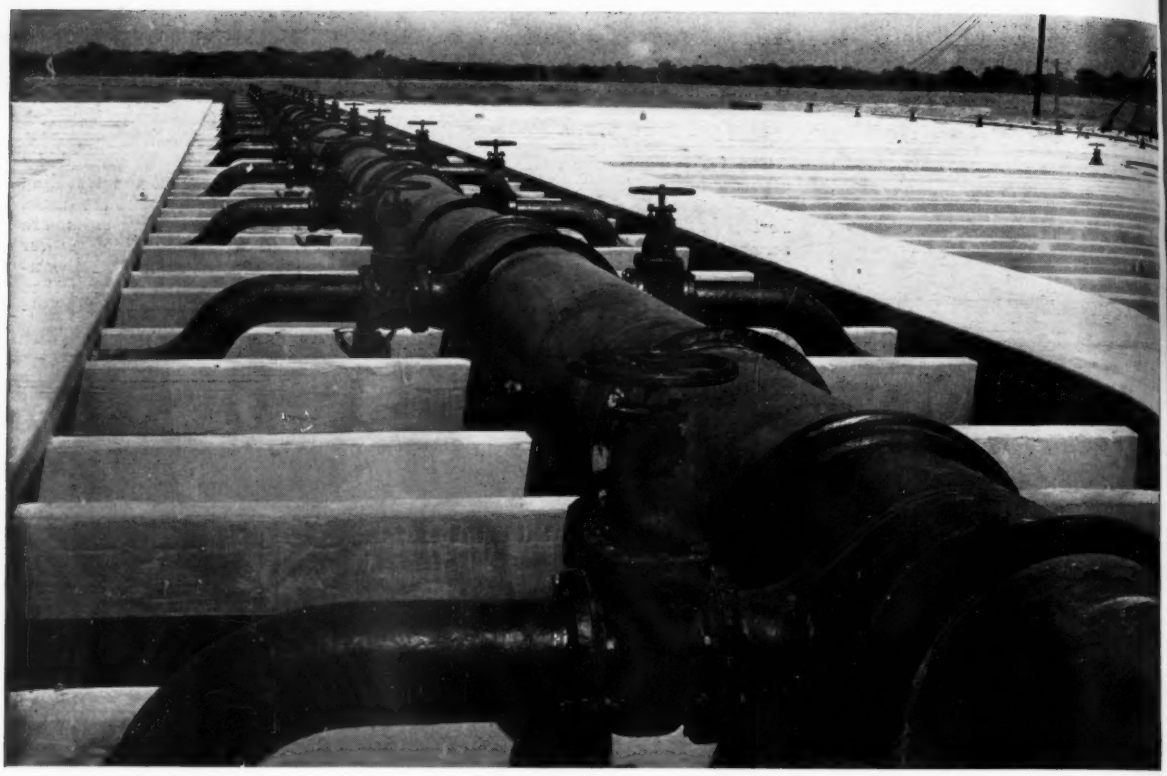
PALO ALTO
CALIFORNIA



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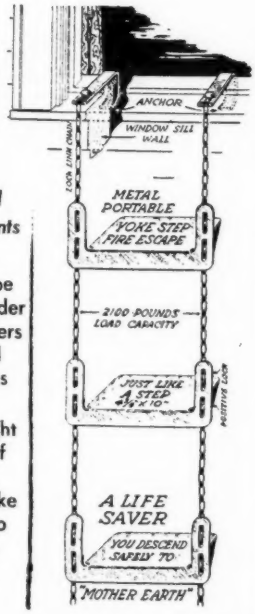


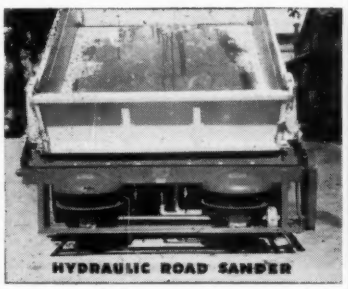
Universal Requirements

•

Fire Escape
Marine Ladder
Steel Workers
Industrial
Air Planes

Light Weight
Fire Proof
Strong
Positive Yoke Step — No Slipping

UNIVERSAL METAL LADDER CO.
Houseman Building
Grand Rapids 2, Michigan



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√ **Controlled Density**
√ **Controlled Direction**

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Material can be spread from 9 ft. to 35 ft. at speeds up to 30 m.p.h. All sprockets and chains are fully enclosed and material can be dumped over spreader without damage. One man can drive truck and operate spreader from cab.

An exclusive Hydro Spreader feature is the automatic gate opening device. When the driver starts the spreader the gates open and as the spreader is stopped the gates automatically close. Immediate delivery.

Write for illustrated folder
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Hydro Spreader Corp.
247 Madison St. Waukesha, Wisc.
Phone: Waukesha 2040

FISHER
M-SCOPE
ELECTRONIC
LEAK DETECTOR

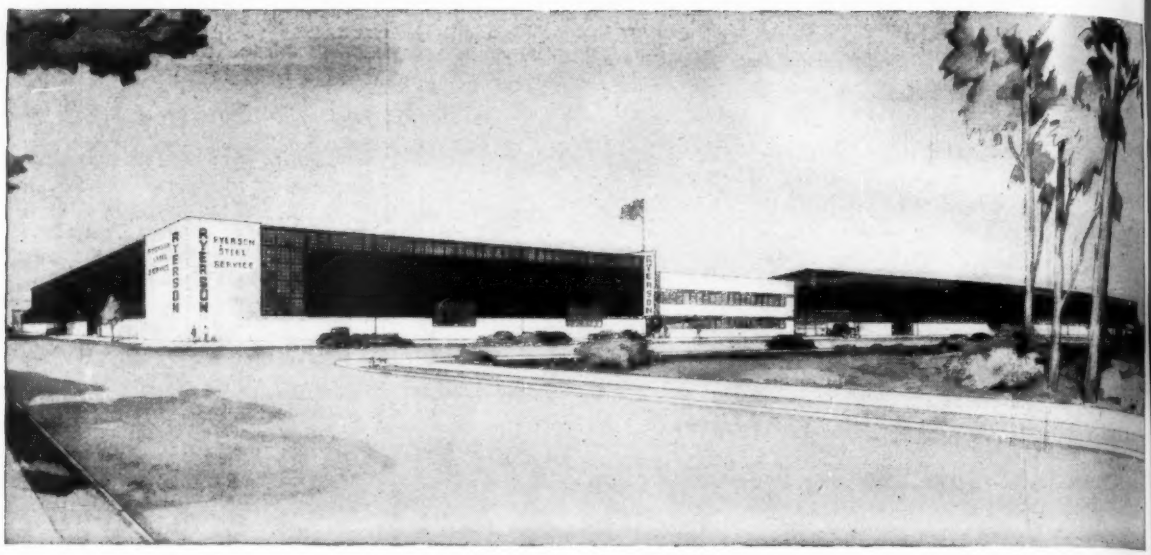
'HAN-DEE' MIDGET DETECTOR LOCATES LEAKS PRECISELY

Why tolerate costly leaks in oil, water, sewage, and pressure lines . . . or waste enormous sums in blind exploratory excavating to find them? The M-Scope "Han-Dee" Midget Leak Finder, an inexpensive electronic instrument, is so sensitive that it can locate the exact trouble with pin-point accuracy . . . even through concrete.

$67.50
up delivered

Write today for **FREE** *16 Page Booklet*

Fisher Research Laboratory, Inc.
PALO ALTO
CALIFORNIA



Announcing

Another Ryerson Steel-Service Plant For the West Coast

We are glad to announce the opening of a new Ryerson steel-service plant in Emeryville, California, just across the bay from San Francisco.

This newest unit in the nation-wide Ryerson network offers quick shipment of every kind of steel to the expanding industry of northern California and the whole Pacific Northwest. Like its twelve sister plants, the San Francisco unit is expertly staffed and excellently equipped. Like the others, it features a service perfected by more than a hundred years in the business of steel distribution.

The largest steel stocks in America are carried in Ryerson plants strategically-located from coast to coast.

Because of current demand, the exact steel you need may not always be on hand. But our stocks turn quickly. A size that's out today may be in tomorrow. So you will find that we can usually take care of your requirements.

Call us for steel from stock — a single piece or a truckload. We will do everything possible to deliver the steel you need when you need it.

Joseph T. Ryerson & Son, Inc. Plants at: New York, Boston, Philadelphia, Detroit, Cincinnati, Cleveland, Pittsburgh, Buffalo, Chicago, Milwaukee, St. Louis, Los Angeles, San Francisco.

PRINCIPAL PRODUCTS: CARBON STEELS - ALLOY STEELS - ALLEGHENY STAINLESS - TOOL STEELS - BARS - STRUCTURALS - PLATES - SHEETS - MECHANICAL TUBING - BOILER TUBES & FITTINGS - REINFORCING BARS - SAFETY FLOOR PLATE - BABBITT METAL SOLDER - MACHINERY & TOOLS, ETC.

RYERSON STEEL

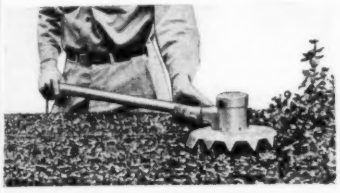
Schudt Appointed By Allis-Chalmers

Harold M. Schudt has been appointed to the position of general manager of the Gadsden, Ala., works by the Allis-Chalmers Mfg. Co., Milwaukee, Wis.

Harold M. Schudt

Mr. Schudt, who has been in the Tractor Division's engineering department for the past nine years, supervised experimentation and building of snow tractors for the government during the early war years. For the past two years he has been on special assignments for Allis-Chalmers.

Electric Hedge Trimmer



A new light-weight electric hedge trimmer that makes a quick job of clipping hedges and shrubbery with its revolving stainless steel blade has been announced by the Trimall Division of Terminal Hardware, Inc., 411 Linden Ave., Wilmette, Ill.

Made of aluminum and weighing 5 pounds, it requires no oiling and only infrequent sharpening. It is powered by a high-speed Universal motor.

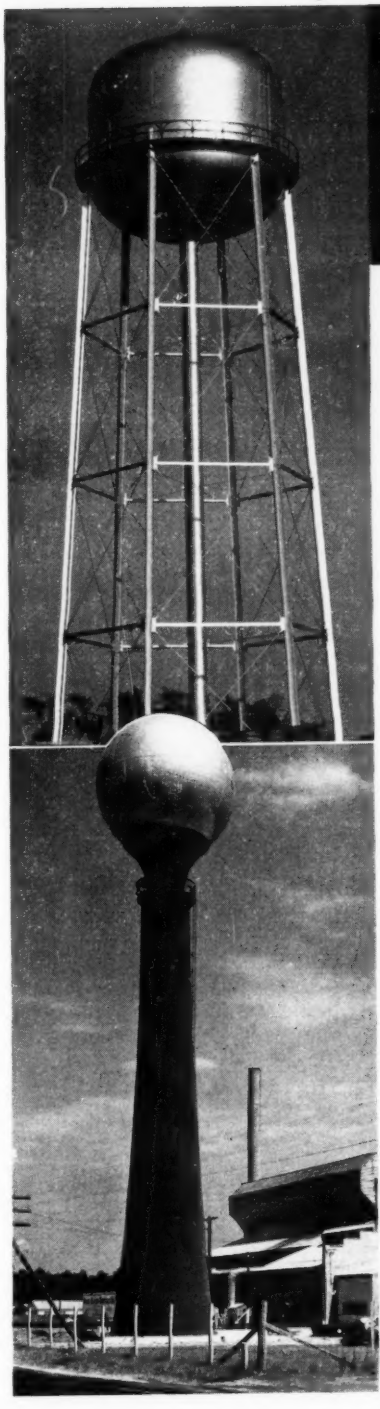
Manufacturers' Agent

Fire Apparatus Pumps

Nationally known line available to manufacturer located in Va., N. C., S. C., or Eastern Tenn. Should be qualified to fabricate complete fire apparatus; install same, including pump, on truck chassis and sell to Municipalities.

Excellent opportunity for body builder or builder of automotive equipment looking for a new product to make. Full cooperation from an old established Pump Manufacturer.

Address:
Box No. 277
The American City Magazine
470 Fourth Avenue
New York 16, N. Y.



TOPS IN TANKS

Scores of cities and industries rely on Cole elevated tanks for dependable water service and constant pressure.

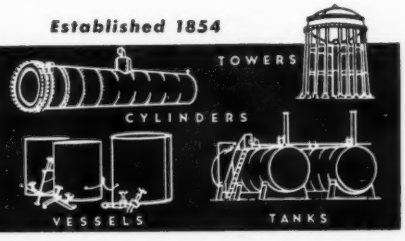
Cole elevated tanks are *correct* in design. Their simplicity contributes to their low cost of maintenance. Capacities 5,000 to 2,000,000 gallons — with hemispherical, ellipsoidal or conical bottoms. Also flat tanks for storage of butane and propane gas. Correctly built, in accordance with ASME specifications.

We invite your inquiries. A large and experienced engineering department is at your service. State capacity, height to bottom and location.

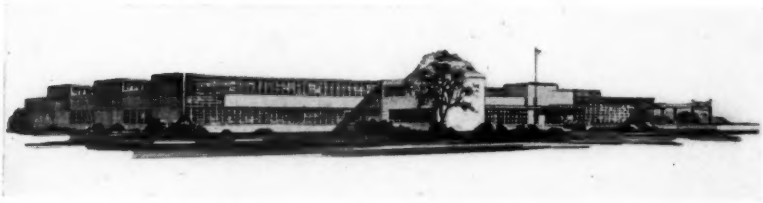
Write for latest Cole catalog—"TANK TALK"

R.D. COLE
MANUFACTURING CO.
NEWNAN, GA.

Established 1854



U. S. Motors Enlarges Milford Plant



New wings are being added to U. S. Motors' Milford plant. With the new foundry and auxiliary buildings, over 75,000 square feet will be available.

The Milford, Conn., plant of U. S. Electrical Motors, Inc., constructed in 1939, is undergoing expansion to more than double its original size. There will be no interruption of manufacturing.

This plant, which will be finished by next June, is intended for the manufacture of motors, Varidrive variable speed drives, Syncrogear gear motors, and explosion-proof and other modifications of brackets.

Hardinge Appoints Sales Agents

The Hardinge Co., Inc., York, Pa., will be represented in the New England states by Fred Gibbs, Engineering Sales Corp., and in Southern Texas by the Chavigny Co. of Houston, Texas. Mr. Gibbs will handle sales of Hardinge clarifiers, automatic backwash rapid sand filters, and digesters in the water works and sewage fields. The Chavigny firm will handle these items in addition to the other Hardinge products it has been selling for the past two years.

This Pipe Handles Corrosive Liquids

Tee showing Amercoat plastic lining. Note plastic extending to the flanges to prevent contents of pipe from coming into contact with the steel pipe.

A plastic-lined pipe that can carry liquids as strong as sulphuric acid is now available through the Amercoat Division, American Pipe and Construction Co., Los Angeles 54, Calif. The pipe lining combines the highly resistant chemical properties of Vinyl resins with the strength and adaptability of steel pipe. The plastic lining has a wall thickness of 0.050 to 0.060 inch.

To be effective, the lining must prevent the contents of the pipe from coming in contact with the steel at the flanges. To protect against this, the pipe liner is molded around the edge of the flange.

Tests have shown the resistance of the plastic lining to a wide variety of normally corrosive liquids. By using standard resistivity tests it was determined that there was no measurable increase in conductance in a solution except caustic soda. Even in the highly conductive materials such as sulphuric and hydrochloric acids, the conductance of the pipe liner remained unchanged over a 5-month period. Revisions in the plastic liner itself will make it possible to provide a lining resistant to high concentrations of strong alkalies also.

FORD RINGSTYLE VALVES and COUPLINGS HIT THE JACKPOT

Never, until Ford's Ringstyle Valves and Couplings were invented, was it possible to set a meter in such close quarters or with so few fittings.

The secret lies in the Ringstyle construction—a threaded coupling nut is pushed over a machined flange from the face side and then a bronze ring is driven into a groove in the nut and behind the flange, making a strong shoulder. These ingenious fittings really hit the jackpot when it comes to saving time and labor costs.

For complete information, send for Ford Catalog No. 46.

FORD

FOR BETTER WATER SERVICES

THE FORD METER BOX COMPANY, INC.
Wabash, Indiana

Distribution Transformers

Line Material single-phase distribution transformers are described in three new bulletins, while a fourth reviews shunt capacitors which produce more pay load on an electrical system.

Bulletin 16-C-1 covers the conventional transformers in 1½- to 500-kva ratings for 2,400 to 14,400 volts. They are also available for odd voltages such as 480, 2,400 or 3,300. The 24 pages furnish an easy means for singling out the ratings, dimensions, illustrations and catalog numbers for each voltage class. Hangers, kickers, and other accessories are described and illustrated.

Bulletin 16-3I-1 covers transformers in the same voltage range as above but in sizes 1½ to 50 kva. Built-in protection is afforded by lightning arresters, circuit breakers and primary winding fuses to take care of possible winding failure. They are installed on single-phase lines in urban or rural areas, but not in three-phase banks, where both lighting and power service are taken from the same bank.

Bulletin 16-R-1 describes two types of transformers for use especially on rural lines. The R.E.A. standard covers 1½ to 10 kva for use on grounded three-phase, four-wire common neutral systems. The EEI-NEMA standard covers 1½ to 25 kva. All three bulletins may be obtained from Line Material Co., Milwaukee 1, Wis.

Capacitors Increase Electric-System Income

Capacitors are increasingly used on electric lines to reduce copper losses, raise voltage, increase the carrying capacity of feeders and regulators and, in a few words, increase revenue without other line investment. The price of the capacitors is often paid for in a short time. The subject is well covered in Bulletin 47075, just released by Line Material Co., Milwaukee 1.

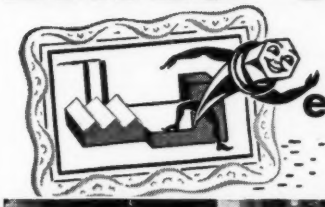
A typical utility experience details how the installation of 90 kva of capacitors costing $600 brought in an additional $1,500 in a year plus boosting the voltage by 2.3%. Each step in manufacturing L-M Elemex shunt capacitors is illustrated, with ample information on capacitor application.

Bohuslav Joins Engineering Controls

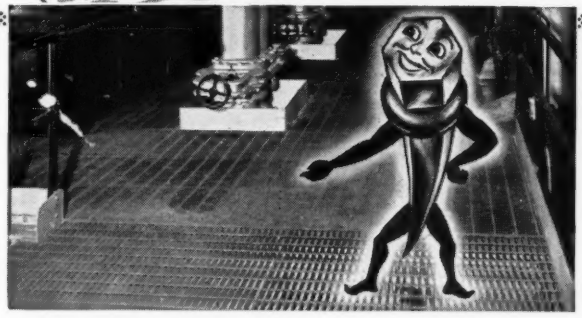
Hans Bohuslav, gasoline- and diesel-engine authority, has joined Engineering Controls, Inc., 2835 E. 11th St., Los Angeles 23, Calif., taking the position of vice-president in charge of engineering.

For the past five years with the Sterling Engine Co. of Buffalo, Mr. Bohuslav gained international recognition for his design and development of the Sterling line of Viking diesels; before that, he was with the Enterprise Engine & Foundry Co.

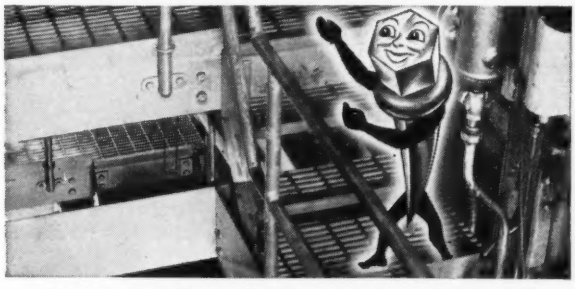
BATES • GRATES



fit into every plant picture



If yours is an application like this—with pipes, installations and stairways cutting into the area— BATES • GRATES *will give you neat, safe and strong open steel flooring.*



Here's where BATES • GRATES *win universal approval—where a series of stairways combine with short walkways. Safe and strong, plenty of light and ventilation all the way down.*

YOU can use BATES • GRATES for flooring any area or running any stairways. They serve to advantage in many ways: They are strong, safe, easy to maintain, durable, provide maximum lighting and ventilation.

The simple directness of BATES • GRATES engineering accounts for these advantages. The key is the Hex Cross bar fillet-welded to stout main bars.

For open steel flooring and stair treads in your plant . . . *Get a Bid from BATES*

Kaar Engineering Expansion

The Kaar plant on Middlefield Road in Palo Alto.

With their recent move into a 35,000-square-foot plant building, the Kaar Engineering Co., Palo Alto, Calif., has completed an expansion program that permits their doubling present production of radiotelephones and marine direction finders.

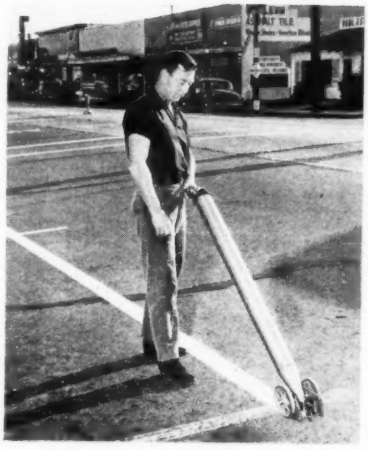
Coinciding with the move into a larger plant, Kaar has announced an agreement which will permit Measurement Engineering, Ltd., of Toronto to manufacture Kaar equipment in Canada. The Toronto company will manufacture under Kaar supervision.

Kaar manufactures two-way mobile and marine radiotelephones in AM and FM, marine direction finders, and station equipment.

Crabgrass Killer Results in Greener Lawns

An effective method of killing crabgrass, thus making way for good grass and greener lawns, has been developed by the O. E. Linck Co. of Clifton, N. J., working in conjunction with Rhode Island State College. The new product, Tat C-Lect, will be distributed nationally this spring.

The company has also formulated a special 2,4-D compound known as Tat Weed C-Lect which may be used with Tat C-Lect. By using the two products together, other weeds can be treated simultaneously with crabgrass.



Line Up with Mark-Rite

Ideal for Parking Meter Area Striping

Lightweight and simple to operate, Mark-Rite is the easy way to paint guide lines. Use it on streets, parking lots, schools and playgrounds, stadiums, swimming pools and warehouses. Aluminum construction and gravity feed assure long, trouble-free service with a minimum of maintenance, requires no air or electrical outlets.

Fully guaranteed. Immediate delivery. Write for illustrated folder and prices.

Mark-Rite UNIVERSAL MFG. & SALES COMPANY

8716 Santa Fe Ave. South Gate, Calif.

RUSTA RESTOR

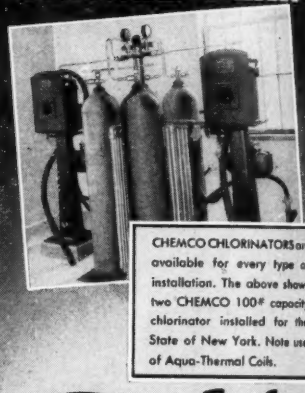
1 Prevents tanks from rusting
2 Keeps tanks in continuous service (no downtime for painting)
3 Reduces tank maintenance and servicing costs

● Rusta Restor employs the basic principles of electro plating to keep tanks in a "neutral" condition that not only prevents rusting, but also removes the effects of any earlier rusting. Inexpensive to install—cheap to operate—safe. Approved by national and state authorities. Write for fully descriptive catalog today!

RUSTA RESTOR
A DIVISION OF
THE JOHNSTON & JENNINGS COMPANY
861 ADDISON ROAD • • • CLEVELAND 14, OHIO

CHEMCO Equipment FOR EVERY CHLORINATION AND WATER CONDITIONING PROBLEM

For Your **SEWAGE PLANT**

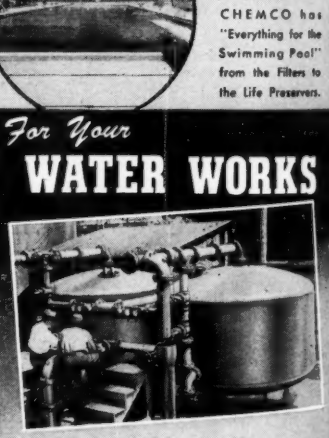


CHEMCO CHLORINATORS are available for every type of installation. The above shows two CHEMCO 100# capacity chlorinator installed for the State of New York. Note use of Aqua-Thermal Coils.

For Your **SWIMMING POOL**

CHEMCO has "Everything for the Swimming Pool" from the Filters to the Life Preservers.

For Your **WATER WORKS**



A large Chemco Filter Plant installation for the Santa Fe Railroad, Winslow, Arizona. Consult CHEMCO first for your Chlorinator or Water Conditioning Problem.

CHEMICAL EQUIPMENT CO.
1700 NO. MAIN STREET
P. O. Box 3098 Terminal Annex
Los Angeles 54, Calif.
MIDWEST FACTORY BRANCH
205 W. Wacker Drive Chicago 6, Ill.
AGENTS IN PRINCIPAL CITIES

Protective Paint for Outdoor Structures and Equipment

By L. P. KAHLER
Joseph Dixon Crucible Co.
Jersey City, N. J.

Municipal officials should know something about protective paint. We will return to this assertion later, and discuss now Dixon flake silica-graphite primer-paint. Structures requiring protection are found in almost every municipal department. They include standpipes, water towers, storage tanks, plant machinery, structural steel, bridges, gas holders, steel and wood refuse barges, fences, metal buildings, lamp posts and street and road machinery.

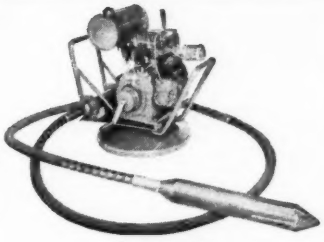
The base of our paints is natural flake graphite combined by nature with silica to form an inert paint pigment. That quality of inertness cannot be overemphasized, when it is recognized that each particle of pigment is surrounded by an envelope of hardened oil. If not inert, the particle either enlarges, rupturing the envelope, or shrinks, leaving a void between pigment and oil. In either case the film has become pervious and lost much of its protective value.

Thickness of the paint film is another factor in protection. Extensive surface coverage is persuasive to the pocketbook, but the passage of years with constant protection and no repainting is the true measure of economy.

Paint failures usually occur from faulty application. Graphite, by its lubricating quality, spreads easily. Flake graphite has marked endurance for an outdoor protective paint. For still further endurance, there is the silica that is mined with the graphite. Here are two excellent pigments, both inert and of low specific gravity, but each needing the characteristics of the other for best results.

What were its lessons of the past war, what improvements do wo now offer in the post-war era?

With no apology we say, "not a thing." It was back in 1907 that we wrote "Every man should know something about protective paint," and furnished about the same information as in the foregoing. Indeed, it was 56 years before that, or 97 years ago, that the then superintendent of our Ticonderoga, N. Y. plant, his oxide and iron paint giving out, used some of the flake graphite which was a product of the plant, to paint a quantity of machinery which plant alterations had required storing out of doors. Twenty-four years later this paint was still in good condition on some of the machines.



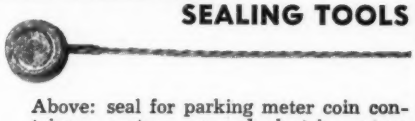
Concrete
VIBRATORS
Gasoline Engine or
Electric Motor Driven
CONCRETE GRINDERS

OTHER PRODUCTS
FRONT END LOADERS
for Industrial Tractors
HEATING KETTLES
for Asphalt and Tar
AGGREGATE DRYERS
for Stone and Sand
ASPHALT PLANTS
Portable—Stationary
Write for Circulars

White Mfg. Co.
ELKHART INDIANA

Insist on AMALEAD
THE WIRE WILL BREAK BEFORE IT WILL PULL OUT OF LEAD
Reg. U. S. Pat.-Off.
SEALS OF MERIT—for EVERY PURPOSE

WIRE SEALS and SEALING TOOLS



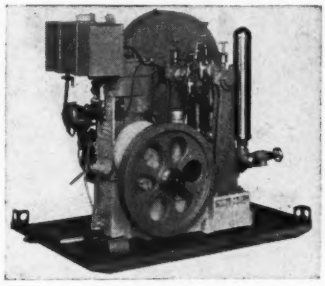
Above: seal for parking meter coin containers, water, gas and electric meters. Also padlock and coin bag seals and sealing tools. Wire lengths as required.

Above: self-locking car seals for automatic voting machines, water and steam valves—no sealing tool required; actual size ⅜" x 8½".

Write for samples, literature and quotations

E. J. BROOKS COMPANY
169 North 13th Street
Newark 7, New Jersey
1873—*Serving Industry 75 Years*—1948

PORTABLE FOREST FIRE PUMP



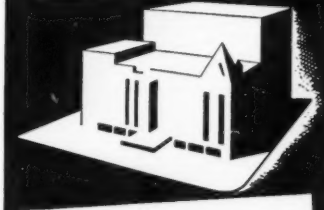
THE GUPTILL PUMP

Here is protection against Forest Fires. A pump designed for dependable service, light and compact enough to be carried, or mounted on a Jeep. A triplex plunger pump delivering full capacity at high pressure.

Write for Information

FITZHENRY-GUPTILL CO.
135 First St., E. Cambridge 41, Mass.

1000 ROOMS
IN
CLEVELAND



HOTEL HOLLENDEN

ROBERT P. JOYCE
GENERAL MANAGER

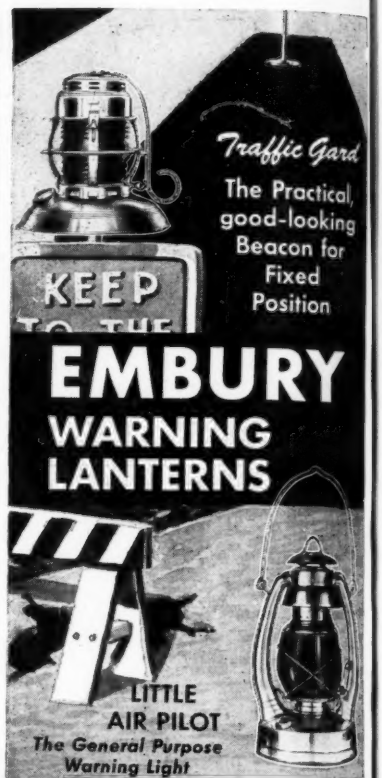
For FAST, LOW COST
STREET PAVING—
BLAW-KNOX
(UNIVERSAL)
STEEL FORMS

Thousands of contractors have switched to Blaw-Knox Steel Forms, and find they get a high dollar return on their investment. Whether the job is city street, curb and gutter or sidewalk—it can be done quicker and cheaper with standard Blaw-Knox form set-ups.

Easy to handle in both placement and removal. Too, the steel imparts a smooth finish to the concrete, eliminating the hand-finishing necessary when expensive wood forms are tediously built for each job. These forms are always ready for action—to use again and again . . . For illustrated data on the complete line, write today for Catalog No. 1859.

BLAW-KNOX DIVISION
of Blaw-Knox Company
2009 Farmers Bank Building
Pittsburgh 22, Pa.

BLAW-KNOX CONSTRUCTION EQUIPMENT



APCO-V-APCO PRIMERS

AUTOMATIC
POWER
OR
TANK PRIMERS

AIR RELEASE VALVES

FOR

FILTER PIPE LINES
DISTRIBUTION LINES
AND OTHER USES
17 TYPES

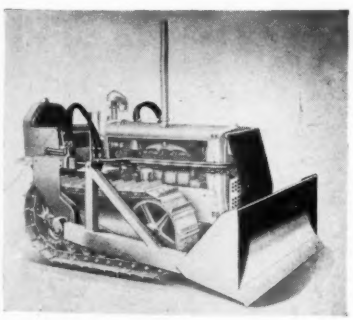
VALVE AND PRIMER CORPORATION

CHICAGO 2, ILL.
30 W. Washington St.

Ryerson Completes Steel Distribution Plant

Joseph T. Ryerson & Son, Inc., Chicago, Ill., has completed the construction of a new steel service plant in Emeryville, across the bay from San Francisco. The plant has complete equipment for cutting and handling steel and for cutting, bending and forming concrete reinforcing bars, and will be able to provide service on a diversified line of steel products: bars, structural shapes, plates, sheets, special steel consisting of hot and cold finished carbon and alloy bars, mechanical tubing, stainless steel in all commercial forms and finishes, and various allied products, including babbitt metal and non-metallic bearings. Wayne D. Dukette, formerly manager of the company's Cincinnati plant, is manager, and Ray C. Page is sales manager.

New Bulldozers From Caterpillar



Two new hydraulic-controlled bulldozers, designed for exclusive use with the Diesel D2 track-type tractor, are in production at the Caterpillar Tractor Co., Peoria, Ill.

The development of the earthmoving tools, the No. 2A angling blade and the No. 2S straight blade bulldozers, for the smallest track-type tractor in the line offers a tool for hauling on street construction and maintenance jobs, brush clearing, earthmoving in tight places, backfilling, material handling, and snow and refuse removal.

Features are: positive action, front-mounted, balance vane-type pump integral with tank and operating valves; manually operated control valve with raise, lower, and hold positions; carburized pins for connecting pistons, cranks, and push arms; high-pressure reinforced hydraulic hose.

The 2A has a blade length of 80 inches for the 40-inch-gage D2 tractor and 97½ inches for the 50-inch-gage tractor. Maximum lift with straight blade is 28 inches for the 40-inch gage, and 34 inches for the 50 gage when the blade is angled but not tilted. It has an 11-inch drop below the ground, a blade angle of 25 degrees and a maximum tilting adjustment of 6 inches.

The No. 2S bulldozer has a blade length of 68 inches for 40-inch gage and 80 inches for the 50-inch gage. Maximum lift is 25 inches and it drops 10 inches below the ground.

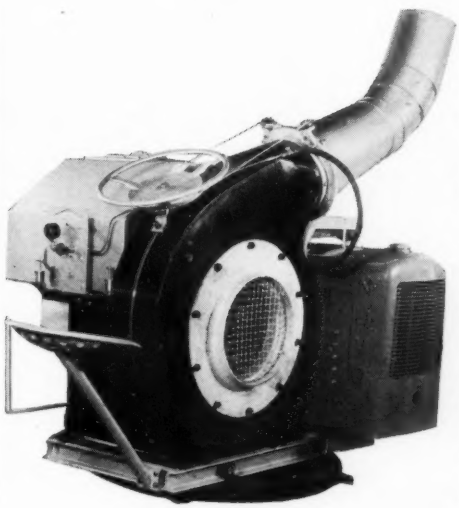
The LAWRENCE

AERO-MIST

SPRAYER

A 3-WAY INVESTMENT

FOR INSECT PEST CONTROL



Here's the new revolutionary mist sprayer that can be used by TREE, PARK and HEALTH departments for protection against defoliators, obnoxious pests and disease carrying insects. One machine for all 3 departments. Fast . . . efficient . . . economical . . . field-tested, the Lawrence Aero-Mist Sprayer projects insecticides to extreme distances in the form of a fine mist. All spray particles work in eliminating pests. Maximum pest protection at a minimum cost assured.

WRITE TODAY FOR FURTHER DETAILS, PRICES, AND FREE BULLETIN #1.

SHARE THE USE 3 WAYS—SHARE THE COST 3 WAYS

TREE DEPARTMENTS

Lawrence Aero-Mist Sprayer for the protection of shade trees and shrubs from defoliators and tree diseases.

PARK DEPARTMENTS

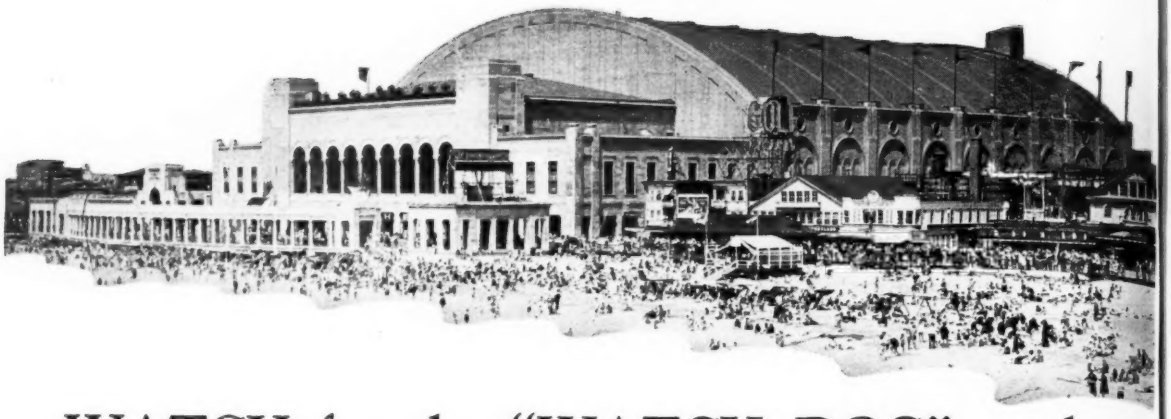
Lawrence Aero-Mist Sprayer for the elimination of obnoxious pests at beaches, ball parks, picnic grounds, playgrounds and public parks.

HEALTH DEPARTMENTS

Lawrence Aero-Mist Sprayer for the protection of community health from dangerous disease-carrying insects.

THE LAWRENCE AERO-MIST SPRAYER COMPANY

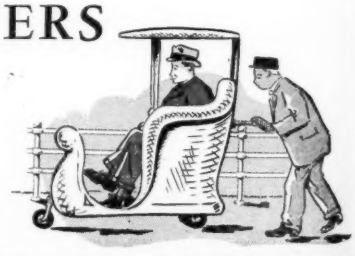
58 Federal St., Greenfield, Mass.



WATCH for the "WATCH DOG" at the Atlantic City Convention

WORTHINGTON-GAMON "WATCH DOG" DISC WATER METERS

also Turbine and Compound Types



WORTHINGTON-GAMON METER COMPANY

Works: NEWARK, NEW JERSEY

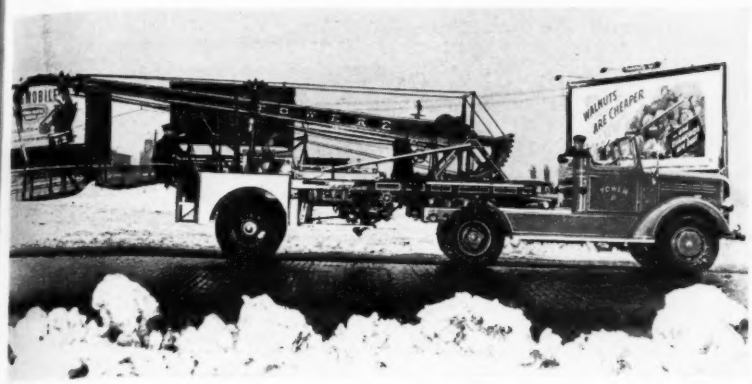
General Offices: 296 SOUTH ST., NEWARK, N. J.

Branch offices in principal cities of the United States

Subsidiary

WORTHINGTON PUMP & MACHINERY CORP.

Boston's Veteran Water Tower



It looks new, it's partly new, it's 54 years old, is Boston's Water Tower No. 2. The veteran tower, newly converted and teamed with the latest model Mack tractor, faces many more years of active service.

A No-Winding Parking Meter

Elsewhere in this issue, the Duncan Meter Corp., Chicago, Ill., announces the manufacture of the Automaton parking meter—"world's first mechanical device embodying the phenomenal principle of 'automatism' in which motion is contained within the mechanism itself."

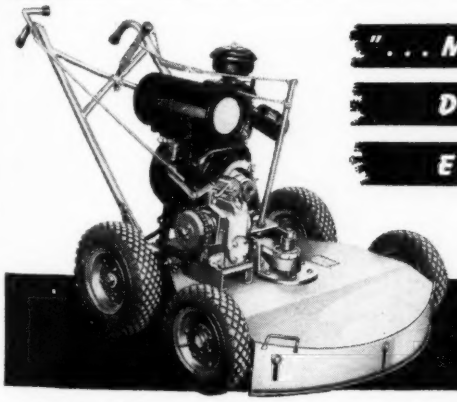
According to Robert F. Broussard, holder of many patents covering various types of parking meters and development designer for the Duncan company, the Automaton parking meter is the culmination of 13 years' creative research to perfect a meter that *never* has to be wound. Mr. Broussard says the mechanism of the Automaton itself does what the motorist or a city-appointed employee does in all other parking meters. In brief, it is "timing without winding."

A peek at the Automaton catalog discloses that altogether over 40 advanced "plus" features are incorporated in the Automaton. Over-all dimensions are 5½ by 13 inches, instruction plates are sealed under glass, and the coin slot is recessed against rain and snow. The mechanism consists of only six sub-assemblies.

In appearance, the design has beauty in keeping with strict utility. The aluminum housing of smooth anodized finish is available in either natural aluminum or choice of sparkling colors.

According to the Duncan announcement, "the Automaton also provides near-magical protection of revenues with a locked coin box, so designed that it may be emptied on street location by a collector, yet coins are never touched by hand."

The Duncan Meter Corp. makes the famous Miller cumulative parking meter now used by over 600 cities.



"... MANEUVERABLE, DEPENDABLE, EFFICIENT"

An enthusiastic user thus praises Whirlwind performance in an unsolicited letter. Name upon request.

ROTARY-SCYTHE, SUCTION-LIFT CUTTING ACTION ... PROVED THROUGH A 16-YEAR SERVICE RECORD!

TRADE-MARK
WHIRLWIND Power Mowers
Reg. U. S. Pat. Off.

... will do these things for your lawns:

1. Cut grass and weeds of any height. Rotary action cuts like a scythe, no matter how tall the growth.
2. Cut grass and weeds in any condition. Matted and tangled masses are lifted by suction and uniformly cut.
3. Cut clippings into a fine mulch for the turf. Allows tender grass to breathe and thrive.
4. Trim under low-hanging shrubbery and up to the edge of walls, fences, trees, monuments, walks and flower beds. Reduces hand trimming.
5. Cut with equal efficiency on both forward and backward travel. No lost motion.

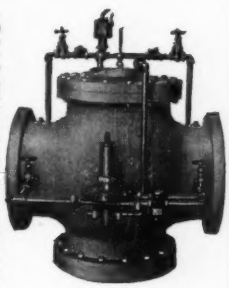
What more could you ask?

Whirlwind's ability to meet all grass-cutting situations is acclaimed by thousands of satisfied users. Write for complete descriptive literature on Grass King, SP, and Junior, and for name of your WHIRLWIND dealer. Address Dept. AC1-4.

WHIRLWIND CORPORATION 3707 N. RICHARDS ST. MILWAUKEE 12, WIS.

ROSS AUTOMATIC VALVES

Altitude Valves for tank and reservoir, with two sets of controls—Automatic Hydraulic and Electric Remote Control. Hydraulic pilot normally operates the valve, while electric pilot is used for emergency only.



Model 40-DAWR Double Acting Valve may be operated by electric pilot regardless of elevation of water in tank or reservoir, for a break in supply or distribution and when fire pressures require direct pumpage. Model 30-AWR Single Acting Valve may be controlled in same manner.

Model 40-AWR Single Acting semi-throttling valve will close on reversal of flow and the electric pilot would serve only a single purpose—either to open wide or close as emergency may require.

Established 1879
ROSS VALVE MFG. CO. Incorporated
P.O. BOX 596, TROY, N.Y.

ALL THIS IN JUST 14 DAYS!

WEAVER CRANE SERVICE, Inc.
CHARLESTON, W. VA.

traveled 750 miles over mountain roads — set 31 underground storage tanks in

11 West Virginia cities with a single

MICHIGAN TRUCK-CRANE

...half the time required by less mobile equipment!

Weaver Crane Service, Inc., operates throughout the state of West Virginia, placing and removing underground storage tanks for a nationally-known petroleum company. They are highly pleased with MICHIGAN'S truck mobility and stamina on the mountainous roads of West Virginia. In the words of Mr. Albert Weaver, "it has given exceptionally good service . . . Had this work been done with a less mobile machine, the same trip would have taken at least thirty days . . . I am proud of my MICHIGAN Crane."

This is typical of the praise of MICHIGAN Shovel-Crane owners everywhere. Get all the facts about MICHIGAN — ask for your copy of "MICHIGAN ON THE JOB" which graphically shows the wide range of cost-cutting applications of these pioneer mobile shovel-cranes.

MICHIGAN

MICHIGAN POWER SHOVEL COMPANY
373 SECOND STREET • BENTON HARBOR, MICHIGAN

Westinghouse Squirrel-Cage Motor

A single-phase Life-Line capacitor-start, induction-run, squirrel-cage motor, which utilizes the capacitor only

for starting and then operates as an induction-run motor, is available from the Westinghouse Electric Corp., P.O. Box 868, Pittsburgh, Pa.

In ratings of ¾, 1, 1½, 2, 3, 5, and 7½ hp, frames 203 through 324, the CAP has air openings in the lower half of the end brackets to give full protection against dripping liquids. Self-sealed, prelubricated ball bearings provide lubrication for five years or longer without repacking.

The motor can be used for single-phase work with reciprocating and centrifugal pumps, refrigeration and air conditioning, and machine tools.

Melts Faster
Saves More Fuel
Easiest to Clean

SPEED-MASTER
KETTLE for **TAR—ASPHALT**
BITUMINOUS COMPOUNDS

Also ask about
Compound Melting Furnaces
Asphalt Surface Heaters
Concrete Heaters
Steam Generators
Torch Burners
Rivet Forges

Immediate delivery on the best producing oil-burning kettle — 40, 55, 80, 115, 165 gal. capacities — on skids, on pneumatic tires or steel wheels. Also with hand or power spray attachments for distributing hot bitumen. Write for catalog No. 661.

HAUCK MANUFACTURING CO.
112-122 Tenth St. Brooklyn 15, N. Y.

Is there
something missing in the plans?

...MAYBE IT'S PROTECTION

—the sort of fencing protection that will keep your project just the way you planned it, year after year. The sort of trouble-free protection that Cyclone Fence is giving to hundreds of power plants, waterworks, parks, playgrounds, stadia and pools.

For Cyclone Fence is tough. Its special design and construction, and its installation by Cyclone's own factory-trained crews, make a fence that stays taut and true despite difficult conditions of climate, weather or terrain. Cyclone is adaptable, too—there are 14 types available to meet your particular requirements.

Send for our free fact-book, which gives full data and specifications. Or if you prefer, have one of our engineers assist you, without obligation, in your planning and estimating. *No job is too large or too small for Cyclone Fence protection.* And if you put U·S·S Cyclone in the original plans, you get full benefit of design harmony and installation economy.

Send for FREE 32-page Book. Profusely illustrated. Full of facts and specifications. Complete information on different types of fence, gates, athletic field equipment, etc. Just mail the coupon.

CYCLONE FENCE DIVISION
(AMERICAN STEEL & WIRE COMPANY)
Waukegan, Ill. · *Branches in Principal Cities*
United States Steel Export Company, New York

CYCLONE FENCE DIVISION · American Steel & Wire Co.
USS
CYCLONE FENCE
UNITED STATES STEEL

Cyclone Fence
Waukegan, Ill., DEPT. B-48

Please send me, free of charge, your 32-page book on Fence.

Name.....

Address.....

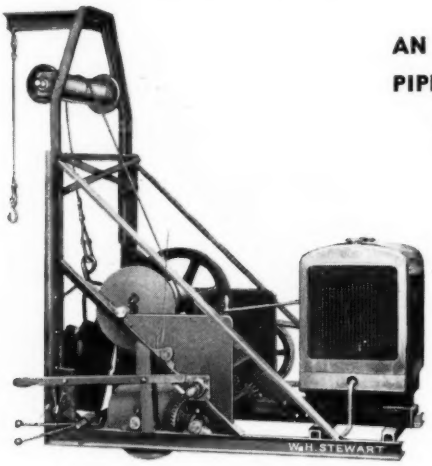
City..... State.....

Title or official capacity.....

UNITED STATES STEEL

1 — ONE DOES IT! — 1

AN ENGINE DRIVEN
PIPE CLEANING MACHINE
for mounting on your truck or tractor



A Complete Line of Pipe Cleaning Equipment

This unit is equipped with a safety automatic clutch — to safeguard the equipment in case of an overload. This single unit, double drum machine operates entirely over one opening. No hand signaling —no confusion. A Power unit complete — ready to be mounted on your truck or tractor — either with engine or driven thru a power take-off.

SEWER CLEANING MACHINES
RENTAL AND SALES

W. H. STEWART, INC.

SINCE 1901
P. O. BOX 767 SYRACUSE, N. Y.

PIPE CLEANING EQUIPMENT
SEWER AND CONDUIT RODS

MAKE YOUR CITY SAFE with ACRO-LYTE

Light the Night with ACRO-LYTE *(Pat. Pending)*

ACRO-LYTE GAUNTLET

DAYLIGHT

DARKNESS

The ACRO-LYTE Gauntlet shown above is best for night signalling because it can be seen from any angle. It reflects light from all directions; it glows in all directions. Easily slips on the wrist in a few seconds; fastens securely with snap.

UNAFFECTED BY WEATHER—Tests have found ACRO-LYTE effective in rain, snow or clear weather.

EASILY CLEANED—Plain soap and water will free ACRO-LYTE of any dirt or smudges the same as cotton fabric.

NON-TOXIC—Absolutely safe to handle.

QUALITY CONSTRUCTED—ACRO-LYTE stands up under rough wear longer without damage.

ACRO-LYTE gives you
DOUBLE PROTECTION in the dark

1. REFLECTS

ACRO-LYTE blazes with the reflected beam of headlights, spotlights, flashlights. *"Scotchlite"** Reflective Sheeting makes ACRO-LYTE shine brilliantly at great distances. It brightly reflects a beam of light from *any* angle, the same as the new shining road signs. Motorists see the ACRO-LYTE warning hundreds of yards away.

2. GLOWS

ACRO-LYTE makes its own light in total darkness. ACRO-LYTE's Luminescent material glows brightly in the dark with light it has stored up during exposure to sun or electric lights. This is the Luminiscent material used by the U. S. Navy for safety markers in unlit places.

WRITE FOR COMPLETE INFORMATION
on ACRO-LYTE Gauntlet, Safety Patrol Belt,
All-Purpose Strap and Webbing-by-the-Foot.

AMERICAN CORD & WEBBING CO., Inc.

374 BROADWAY NEW YORK 13, N. Y.

**Reg. Trade Mark Minnesota Mining & Mfg. Co.*

Low-Priced Line Marker

A low-priced companion to its De-Luxe portable line-marking device is being manufactured by the Universal Mfg. and Sales Co., 8716 Santa Fe Ave., South Gate, Calif. The Junior is designed for use where the area to be covered is fairly small, but where neat, clean lines are needed.

Brushing at walking speed, the device can be used for marking lines or lettering simple pavement signs. It can be cleaned by flushing the container, valve, and brushes with gasoline or thinner. The hog bristles can be replaced by the operator when necessary. The Junior weighs 3 pounds, and it is priced at $18.50 f.o.b. Los Angeles.

Power Mower Climbs Steep Grades

The ability to cut close to hedges, trees, walls, and other barriers as well as power for climbing steep grades and mowing through tough, long grass without leaving ridges are among the features of the Trimalawn, manufactured by Reo Motors, Inc., Lansing, Mich.

The mower, available in a 21-inch-cut model with a capacity of 3 acres a day and a 24-inch-cut model with a capacity of 4 acres a day, is powered by a 1½-hp engine. A flexible "knee action" mounting on the tractor, developed by Reo engineers, allows the cutting unit to follow the ground contours closely, providing a very even cut. The unit rides on narrow skids.

An accessory which may be used with the mower is a 24-inch snowplow for use on sidewalks and driveways.

Mows Grass or Plows Snow

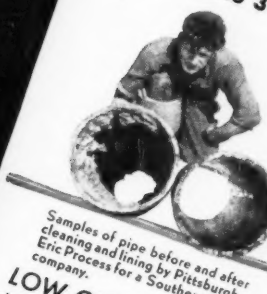
Now's the time when owners of a Cunningham snowplow-grader are unbolting the 40-inch blade and bolting on the 36-inch sickle bar. For the Cunningham tractor is a year-round worker, with a 1½-hp 4-cycle engine that furnishes the power for plowing, mowing, spraying, cultivating, harrowing, or seeding. In addition to the sickle-bar mower, there is also a new power lawn mower. Literature is

available from James Cunningham, Son & Co., Rochester 8, N. Y.

PITTSBURGH - ERIC RECONDITIONING PROCESS

- PROLONGS LIFE OF SMALL WATER MAINS
- RESTORES FULL CAPACITY
- MAINTAINS HIGH VOLUME
- ELIMINATES RED WATER
- ECONOMICALLY APPLIED
- PRESERVES EQUITY OF WATER MAIN INVESTMENT

FOR WATER MAINS 3"-24" I. D.



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2,500,000 Feet Coated in 10 Years

LECTUMEN COATING

LECTUMEN is an emulsified solution of bitumen especially prepared for use with Pittsburgh-Eric Process. Imparts a smooth, long-lasting coating to steel and C. I. pipe interiors. As much as 1,000 feet of main can be cleaned and lined at one time. Under normal conditions, service can be restored the same day.

PITTSBURGH PIPE CLEANER COMPANY

133 Dahlem St., Pittsburgh 6, Pa.

PHILADELPHIA · BALTIMORE · WASHINGTON · NEW YORK · BUFFALO · CHICAGO
CINCINNATI · ST. LOUIS · DETROIT · BOSTON

The SHOW PLANT of AMERICA

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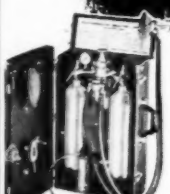

REVIVES
victims of
Drowning
Heat and Smoke Suffocation
Monoxide Poisoning
other forms of
ASPHYXIA

See an actual demonstration of the amazing precision breathing instrument . . . the

RESUSCITATOR
INHALATOR — ASPIRATOR

No obligation—write today to Dept. N4
E & J Manufacturing Co., Glendale 1, Calif.

Interchangeability
. . AN OUTSTANDING FEATURE OF
BUFFALO METERS

Buffalo Meter Company has perfected an interchangeability of parts that is unsurpassed. Not just an interchange of expensive unit assemblies, but *actual interchangeability of parts, piece for piece.*

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AMERICAN BRONZE CASE
NIAGARA GALV. IRON CASE
WATER METERS
BUFFALO METER COMPANY
2902 MAIN STREET • BUFFALO 14, NEW YORK
Simplicity

wedges have been

ALL THIS IN JUST 14 DAYS!

WEAVER CRANE SERVICE, Inc.
CHARLESTON, W. VA.

traveled 750 miles over mountain roads — set 31 underground storage tanks in

11 West Virginia cities with a single

MICHIGAN TRUCK-CRANE

...half the time required by less mobile equipment!

Weaver Crane Service, Inc., operates throughout the state of West Virginia, placing and removing underground storage tanks for a nationally-known petroleum company. They are highly pleased with MICHIGAN'S truck mobility and stamina on the mountainous roads of West Virginia. In the words of Mr. Albert Weaver, "it has given exceptionally good service . . . Had this work been done with a less mobile machine, the same trip would have taken at least thirty days . . . I am proud of my MICHIGAN Crane."

This is typical of the praise of MICHIGAN Shovel-Crane owners everywhere. Get all the facts about MICHIGAN — ask for your copy of "MICHIGAN ON THE JOB" which graphically shows the wide range of cost-cutting applications of these pioneer mobile shovel-cranes.

MICHIGAN

MICHIGAN POWER SHOVEL COMPANY
373 SECOND STREET • BENTON HARBOR, MICHIGAN

Westinghouse Squirrel-Cage Motor

A single-phase Life-Line capacitor-start, induction-run, squirrel-cage motor, which utilizes the capacitor only

for starting and then operates as an induction-run motor, is available from the Westinghouse Electric Corp., P.O. Box 868, Pittsburgh, Pa.

In ratings of ¾, 1, 1½, 2, 3, 5, and 7½ hp, frames 203 through 324, the CAP has air openings in the lower half of the end brackets to give full protection against dripping liquids. Self-sealed, prelubricated ball bearings provide lubrication for five years or longer without repacking.

The motor can be used for single-phase work with reciprocating and centrifugal pumps, refrigeration and air conditioning, and machine tools.

Melts Faster
Saves More Fuel
Easiest to Clean

SPEED-MASTER
KETTLE for **TAR—ASPHALT**
BITUMINOUS COMPOUNDS

Also ask about
Compound Melting Furnaces
Asphalt Surface Heaters
Concrete Heaters
Steam Generators
Torch Burners
Rivet Forges

Immediate delivery on the best producing oil-burning kettle — 40, 55, 80, 115, 165 gal. capacities — on skids, on pneumatic tires or steel wheels. Also with hand or power spray attachments for distributing hot bitumen. Write for catalog No. 661.

HAUCK MANUFACTURING CO.
112-122 Tenth St. Brooklyn 15, N. Y.

Is there

something missing in the plans?

...MAYBE IT'S PROTECTION

—the sort of fencing protection that will keep your project just the way you planned it, year after year. The sort of trouble-free protection that Cyclone Fence is giving to hundreds of power plants, waterworks, parks, playgrounds, stadia and pools.

For Cyclone Fence is tough. Its special design and construction, and its installation by Cyclone's own factory-trained crews, make a fence that stays taut and true despite difficult conditions of climate, weather or terrain. Cyclone is adaptable, too—there are 14 types available to meet your particular requirements.

Send for our free fact-book, which gives full data and specifications. Or if you prefer, have one of our engineers assist you, without obligation, in your planning and estimating. *No job is too large or too small for Cyclone Fence protection.* And if you put U·S·S Cyclone in the original plans, you get full benefit of design harmony and installation economy.

Send for FREE 32-page Book. Profusely illustrated. Full of facts and specifications. Complete information on different types of fence, gates, athletic field equipment, etc. Just mail the coupon.

CYCLONE FENCE DIVISION
(AMERICAN STEEL & WIRE COMPANY)
Waukegan, Ill. · *Branches in Principal Cities*
United States Steel Export Company, New York

CYCLONE FENCE DIVISION · American Steel & Wire Co.
USS CYCLONE FENCE
UNITED STATES STEEL

Cyclone Fence
Waukegan, Ill., DEPT. B-48

Please send me, free of charge, your 32-page book on Fence.

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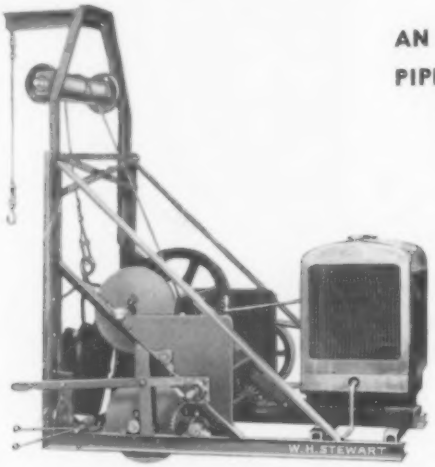
City..... State.....

Title or official capacity.....

UNITED STATES STEEL

1 — ONE DOES IT! — 1

AN ENGINE DRIVEN
PIPE CLEANING MACHINE
for mounting on your truck or tractor



A Complete Line of Pipe Cleaning Equipment

This unit is equipped with a safety automatic clutch — to safeguard the equipment in case of an overload. This single unit, double drum machine operates entirely over one opening. No hand signaling —no confusion. A Power unit complete — ready to be mounted on your truck or tractor — either with engine or driven thru a power take-off.

SEWER CLEANING MACHINES
RENTAL AND SALES

W. H. STEWART, INC.

SINCE 1901
P. O. BOX 767 SYRACUSE, N. Y.

PIPE CLEANING EQUIPMENT
SEWER AND CONDUIT RODS

MAKE YOUR CITY SAFE with ACRO-LYTE

Light the Night with ACRO-LYTE *(Pat. Pending)*

ACRO-LYTE GAUNTLET

DAYLIGHT

DARKNESS

The ACRO-LYTE Gauntlet shown above is best for night signalling because it can be seen from any angle. It reflects light from all directions; it glows in all directions. Easily slips on the wrist in a few seconds; fastens securely with snap.

UNAFFECTED BY WEATHER—Tests have found ACRO-LYTE effective in rain, snow or clear weather.

EASILY CLEANED—Plain soap and water will free ACRO-LYTE of any dirt or smudges the same as cotton fabric.

NON-TOXIC—Absolutely safe to handle.

QUALITY CONSTRUCTED—ACRO-LYTE stands up under rough wear longer without damage.

ACRO-LYTE gives you

DOUBLE PROTECTION in the dark

1. REFLECTS

ACRO-LYTE blazes with the reflected beam of headlights, spotlights, flashlights. *"Scotchlite"** Reflective Sheeting makes ACRO-LYTE shine brilliantly at great distances. It brightly reflects a beam of light from *any* angle, the same as the new shining road signs. Motorists see the ACRO-LYTE warning hundreds of yards away.

2. GLOWS

ACRO-LYTE makes its own light in total darkness. ACRO-LYTE's Luminescent material glows brightly in the dark with light it has stored up during exposure to sun or electric lights. This is the Luminiscent material used by the U. S. Navy for safety markers in unlit places.

WRITE FOR COMPLETE INFORMATION
on ACRO-LYTE Gauntlet, Safety Patrol Belt,
All-Purpose Strap and Webbing-by-the-Foot.

AMERICAN CORD & WEBBING CO., Inc.

374 BROADWAY NEW YORK 13, N. Y.

**Reg. Trade Mark Minnesota Mining & Mfg. Co.*

Low-Priced Line Marker

A low-priced companion to its De-Luxe portable line-marking device is being manufactured by the Universal Mfg. and Sales Co., 8716 Santa Fe Ave., South Gate, Calif. The Junior is designed for use where the area to be covered is fairly small, but where neat, clean lines are needed.

Brushing at walking speed, the device can be used for marking lines or lettering simple pavement signs. It can be cleaned by flushing the container, valve, and brushes with gasoline or thinner. The hog bristles can be replaced by the operator when necessary. The Junior weighs 3 pounds, and it is priced at $18.50 f.o.b. Los Angeles.

Power Mower Climbs Steep Grades

The ability to cut close to hedges, trees, walls, and other barriers as well as power for climbing steep grades and mowing through tough, long grass without leaving ridges are among the features of the Trimalawn, manufactured by Reo Motors, Inc., Lansing, Mich.

The mower, available in a 21-inch-cut model with a capacity of 3 acres a day and a 24-inch-cut model with a capacity of 4 acres a day, is powered by a 1½-hp engine. A flexible "knee action" mounting on the tractor, developed by Reo engineers, allows the cutting unit to follow the ground contours closely, providing a very even cut. The unit rides on narrow skids.

An accessory which may be used with the mower is a 24-inch snowplow for use on sidewalks and driveways.

Mows Grass or Plows Snow

Now's the time when owners of a Cunningham snowplow-grader are unbolting the 40-inch blade and bolting on the 36-inch sickle bar. For the Cunningham tractor is a year-round worker, with a 1½-hp 4-cycle engine that furnishes the power for plowing, mowing, spraying, cultivating, harrowing, or seeding. In addition to the sickle-bar mower, there is also a new power lawn mower. Literature is

available from James Cunningham, Son & Co., Rochester 8, N. Y.

PITTSBURGH - ERIC RECONDITIONING PROCESS

- PROLONGS LIFE OF SMALL WATER MAINS
- RESTORES FULL CAPACITY
- MAINTAINS HIGH VOLUME
- ELIMINATES RED WATER
- ECONOMICALLY APPLIED
- PRESERVES EQUITY OF WATER MAIN INVESTMENT

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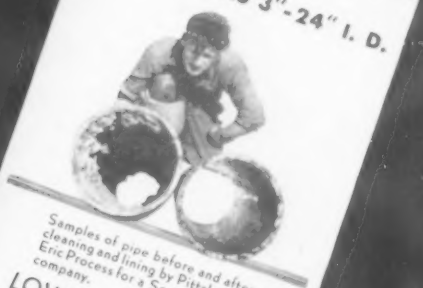

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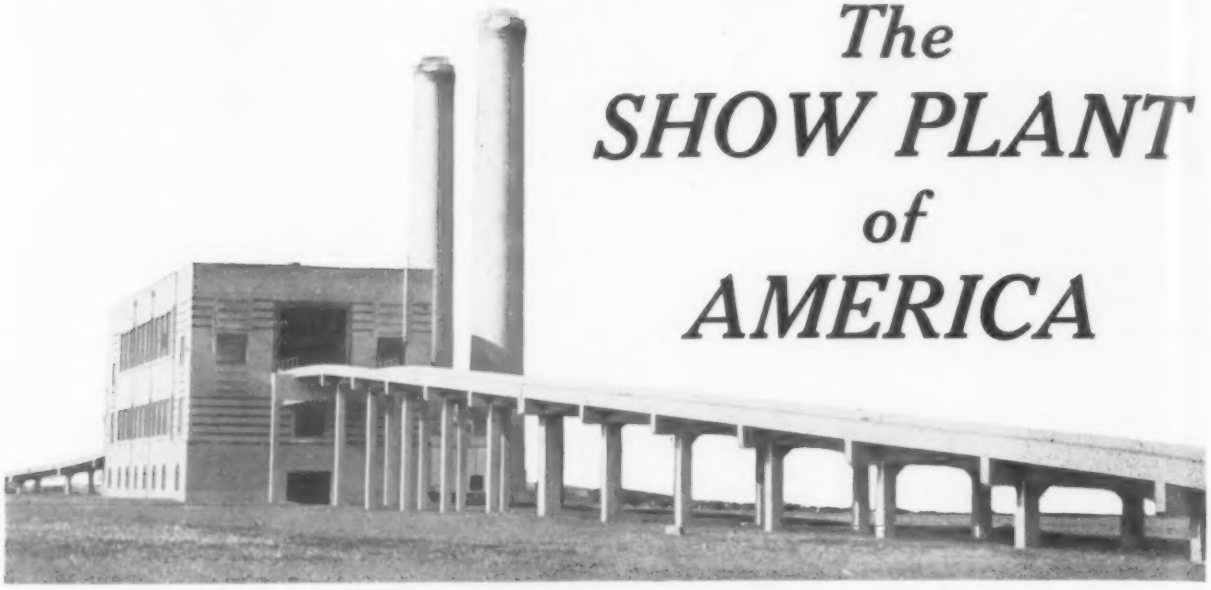
The SHOW PLANT of AMERICA



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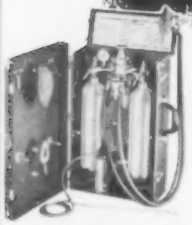

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victims of
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E and J

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INHALATOR – ASPIRATOR

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NIAGARA GALV. IRON CASE
WATER METERS
BUFFALO METER COMPANY
2902 MAIN STREET • BUFFALO 14, NEW YORK
Simplicity

When Power Lines Fail

Modern Municipalities

DEPEND ON

JOHNSON
Combination DRIVES

CONTINUOUS WATER SUPPLY... protects the public health and reduces fire hazard.

FLOOD DAMAGE... insures 24-hour operation of drainage pumps in any emergency — day in and day out.

RESERVE POWER... will transmit additional power to meet emergency requirements... instantly available.

SEWAGE... long record of use in Sewage Systems for continuous 24-hour constant service.

ADAPTABLE... made in a wide range of sizes and types to meet varied application.

INVESTIGATE BEFORE IT'S TOO LATE. Hundreds of municipalities throughout the country rely on the Johnson Combination Gear Drives for supplementary power. (See illustration.) Send for catalog and full engineering details.

JOHNSON GEAR
AND MANUFACTURING CO.

MAIN OFFICE & WORKS • BERKELEY 2 • CALIFORNIA

EASY to LAY

McWANE PRECALKED CAST IRON PIPE can be laid with a minimum of time and labor because lead and redwood wedges have been placed in the pipe bells at the foundry. One man can do the work because all he needs to do is "Socket the Spigot and Calk!" McWANE CAST IRON PIPE lasts for centuries, too.

"Just Socket the Spigot and Calk"

McWANE CAST IRON PIPE CO.

Birmingham 2, Alabama

McWane PRECALKED Pipe

All Sizes: 2 inches through 12 inches

LOST

Black cow-hide zipper bag with lock broken, marked R. B. E. and with foreign labels pasted on it. Lost January 27, 1948 at noon in parked automobile at entrance of Statler Building, Boston, Mass.

Contents: Important papers, address book, 1947 private diary No. 5164, printed by the National Blank Book Company, Holyoke, Mass., and on the inside cover the name of R. B. Everson, 214 West Huron Street, Chicago 10, Illinois. Reward $100 for recovery. Notify Boston, Mass. Police 16.

CITY OF MILFORD

SEEKS

QUALIFIED MANAGER

APPLICATIONS for the position of city manager are being accepted by the Council of the City of Milford, Delaware. The city owns and operates its own light, water and sewerage systems, has a population of approximately 5,000. Applications may be made to Mr. C. VanNuis Wilkerson, Mayor, City Office, Milford, Delaware.

MAY 1948

MAY 14 1948

The American City

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UNIV. OF MICH.

ATLANTIC CITY, N. J.

Meeting place, May 3-7, of the

merican Water Works Association

Water-works articles in this issue of The American City include:

It's No Longer an Experiment

Marshalltown, Iowa, water works gives late data on the economies of reclaiming lime sludge. See pages 86-87.

Painless Payments

Tyler, Texas, develops an easy-to-take arrangement for water-main extensions. See pages 94-95.

Those Pipeline Breaks

Newark, N. J., water department makes pipeline repair procedure an exact science. See pages 106-107.